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THE UNIVERSITY OF ALBERTA

THE ECONOMY OF PALATALIZATION IN GALLO-ROMANCE

by

Ⓒ François-Xavier Nève de Mévergnies

A THESIS

SUBMITTED TO THE FACULTY OF GRADUATE STUDIES AND RESEARCH
IN PARTIAL FULFILMENT OF THE REQUIREMENTS FOR THE DEGREE
OF DOCTOR OF PHILOSOPHY

DEPARTMENT OF ROMANCE LANGUAGES AND LITERATURE

EDMONTON, ALBERTA

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THE UNIVERSITY OF ALBERTA

FACULTY OF GRADUATE STUDIES AND RESEARCH

The undersigned certify that they have read, and recommend to the Faculty of Graduate Studies and Research, for acceptance, a thesis entitled The Economy of Palatalization in Gallo-Romance submitted by François-Xavier Nève de Mévergnies in partial fulfilment of the requirements for the degree of Doctor of Philosophy.

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ABSTRACT

The functional-structural method employed to account for the Gallo-Romance palatalizations from the viewpoint of linguistic economy is presented, and its advantages in this type of study are discussed.

The process of palatalization, posited to account for a series of sound changes which contributed to the transformation of Latin into Old French, is described together with assibilation, a process at times linked with, although distinct from, palatalization itself.

A critical survey of previous accounts of these changes reveals that scholarly opinion has been divided on the particular issue of the phonetic channels taken; phonetic data, which seem to favour the hushing channel, appear in contradiction to philological data, which have traditionally appeared to support the hissing channel.

An analysis of the philological data removes the contradiction insofar as they allow for either interpretation. The hushing channel may thus be retained as a plausible hypothesis. A first description of the developments indicates the necessity of a phonological viewpoint to further specify the relative chronology of some changes. Functional hypotheses inspired by this viewpoint appear also to contribute to the explanation of some of these changes.

ABBREVIATIONS AND PERIODICALS

ACLS: American Council of Learned Societies

Acta Linguistica

AGI: *Archivio glottologico italiano*

ALF: *Atlas linguistique de la France*

ALI *Atlante linguistico italiano*

ALW: *Atlas linguistique de la Wallonie*

Annales de la Faculté de Lettres de Toulouse

Archivum Linguisticum

Atti della Reale Accademia delle Scienze di Torino

The British Journal for the Philosophy of Science

BSL: *Bulletin de la Société de Linguistique de Paris*

Cahiers F. de Saussure: *Cahiers Ferdinand de Saussure*

The Canadian Journal of Linguistics

CL: Classical Latin

Diogène: *Revue Diogène*

ed.,eds.: editor and cognate terms.

FM: *le Français Moderne*

Folia Linguistica

Foundations of Language

Germ: Germanic

Glossa

Harvard Studies in Classical Philology

I.-E.: Indo-European.

Journal of the Acoustic Society of America

Journal of Linguistics

Journal de Psychologie (normale et pathologique).

Keil: Heinrich Keil, Grammatici latini (cf. Bibliography)

Langages

Language

Le Langage et l'Homme

Lingua

Lingua Nostra

Linguistics

La Linguistique

Marche Romane

Le Monde

ms.: manuscript

OL: Old Latin

Orbis

Phonetica

Revue de Philologie Française

RFE: Revista de Filología Española

RLaR: Revue des Langues Romanes

RLiR: Revue de Linguistique Romane

Romania

Romanica Gandensia

RPh: Romance Philology

Science

Scientific American

Studi di Filologia Italiana

Studi di Filologia Romanza

Studia Neophilologica

Studies in Linguistics

Studium Generale

TCLC: *Travaux du Cercle Linguistique de Copenhague*

TCLP: *Travaux du Cercle Linguistique de Prague*

tr.: translated by

Travaux de Linguistique et Littérature de l'Univ. de Strasbourg.

Univ.: University and cognate terms.

VL: Vulgar Latin

Wiener Studien

Word

ZRPh: *Zeitschrift für romanische Philologie*

Zeitschrift für vergleichende Sprachforschung

SYMBOLS

Sound Symbols

The phonetic and phonemic symbols used are those of the International Phonetic Association. The alveo-palatal space is further specified according to the findings (and, partly, the notation) of L. Ščerba ("Notes sur la transcription phonétique," p. 14):

fig. 1: *The Palatal Symbols*

	alveolar	palato-alveolar	prepalatal	mediopalatal	postpalatal
occlusion	t, d	t', d'	ṭ, ḍ	c, ɟ	k', g'
affrication	ts, dz	t'ṣ, d'ẓ	tʃ, dʒ	cś, ɟź	k'χ, g'γ
friction	s, z	ṣ, ẓ	ʃ, ʒ	ś, ź	χ, γ
glide				ç, j	
	apical	apical	apico-retroflex	dorsal	dorsal

Following the recent literature on the subject (see *Phonetica, passim*), the terms *hiss* and *hush* are used to designate *hissing* and *hushing* sounds, i.e., *sifflantes* and *chuintantes* respectively, as in *sack* and *shack*; intermediary sounds are accordingly labelled *hishes*.

Other Symbols

Square brackets [] are employed to symbolize phonetic notations, and oblique bars // to symbolize phonemic notations.

Underlined transcriptions refer to their standard orthography; double quotes "" to a form attested under that spelling. *Single quotes* '' indicate meaning. *Right-oriented angles* > mean 'develops into, becomes'; *left-oriented* ones < 'developed from, from.' *Asterisks* * to the left of a form or a sequence of forms indicate that the form or sequence of forms is unattested. *Latin capital letters* are used for Classical Latin forms. The symbol vs means 'by opposition to, as opposed to'; ≃ 'or, alternative form, optional variant'; = 'equals, is equivalent to, i.e.' For example, the Francien evolution of AQVA = /AK^{w}A/ ['aːkwa] 'water' > *['ɛwə] ≃ [awə] "eaue" around 1300 A.D. > /o/ in Modern French *eau*. The symbol ∅ means 'zero, nothing'; thus the combination > ∅ means 'lenites out, disappears.'

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INTRODUCTION: THE FUNCTIONAL-STRUCTURAL THEORY

This study attempts to describe and explain a sequence of sound changes which contributed to transforming the Latin spoken in Gaul into Old French. These changes, known as "palatalizations," have aroused keen interest and controversy from the time of Friedrich Diez to the present, and have inspired an abundant literature. Most works, however, have been concerned with only one or two aspects of the development. This study attempts to combine the contributions of the various linguistic and philological viewpoints and to submit globally plausible hypotheses concerning the historical reality of the Gallo-Romance processes. Its theoretical framework, particularly in the synthesis (presented in paragraphs 4.31 - 4.36, as a summary of the functional hypotheses developed in Chapter Four), is the theory of linguistic economy defined by functional-structuralism.[1]

Inductive vs Deductive Approaches

0.1 In recent years, this theory has been challenged, mainly by generative grammarians. It has been criticized for not being a theory in the scientific sense, and for entertaining hypotheses about language and language change that have proved unsatisfactory, or at least doubtful. For one thing, functional-structuralism--as modern linguistics since August Schleicher[2]--claims to be founded on observation, and to work with inductive methods. Induction, however, has been criticized, as a mental procedure for arriving at hypotheses explaining the observable data; as I. Lakatos expresses it, "facts do not suggest conjectures and do not support them either."[3] Generative Theory has recognized the logical value of the idea according to which facts by themselves cannot yield any knowledge without free conception. Emmon Bach, for example, proclaims the failure and fundamental error of inductive approaches; the "Baconian" attitude must be rejected.[4] It must be replaced by a deductive, "Keplerian" approach (p. 120), where facts and particular hypotheses are apprehended and judged within the theory (or fundamental hypothesis) itself. Generative Theory--and generative grammars--fulfil this logical prerequisite to a scientific theory; functional-structuralism does not (see below, 0.9.). It may be, however, that the difficulty is essentially logical, and has no immediate bearing on the real fruitfulness of the competing theories. Whether one is criticized for relying unduly on deduction (the reproach is thus the "Procustean"[5] one) or on induction (the reproach then being methodological) may be secondary. All theories have hypotheses, work along deductive lines, and check the data, returning to the hypotheses along inductive paths. No theory can be only inductive; no (modern?) man thinks exclusively in deductive terms. The functional-structural theory of linguistic economy is perhaps neither less nor more deductive than the set of hypotheses proposed by generative grammar. There may be, however, a difference of emphasis in the procedure, reflected in the fact that most generative studies start by exposing their hypothesis, then proceed to justify it in reality, whereas functional research usually appears presented as such, offering its hypothesis only as a synthesis.

Functional-Structuralism as Part of the Humanities

0.2 Still inspired by Popper, it seems, Generative Theory has criticized structuralism for not being a scientific theory. In particular, functional-structuralism is supposed to lack the requirements of a scientific theory insofar as it is impossible to falsify. Functional-structuralism is so vague that it is invulnerable when confronted with the data, whatever they may be. In fact, it could account for any kind of data since no parameters must be rejected *a priori*; on the contrary any kind of pressure may be brought in as a variable, at any step of the explanation. Functional-structuralism is incapable of prediction. As such it is only a label attached to nothing. It may be comparable in essence to the medieval concept of *impetus*, with which one could justify anything afterwards, but not predict anything.[6] Functional-structuralism is thus not a scientific theory, within this frame of reference.

0.3 This type of criticism presupposes that functional-structuralism considers language as a reality determined with the same rigour as physico-chemical reality, and simply fails to conceive of a hypothesis that would at least meet this prerequisite. This assumption is erroneous. Functional-structuralism suggests that language is not determined by a limited number of parameters which can be experimented upon. The number of parameters is practically unlimited because language is a tool that reflects the most sophisticated mental life of human beings. In diachrony, especially, functional-structuralism considers that determinism is all the more difficult to accept as a working hypothesis since anything that is historical (and thus unique) in nature has an infinitely complex causality.[7] In this sense, functional-structuralism does not start as a scientific hypothesis that will later have to be modified to fit an object that cannot be reduced to physico-chemical conditioning, but rather as an absence of hypothesis. Since language, however, is largely influenced by measurable constraints, functional-structuralism recommends that the investigation, although essentially historical, make the largest possible use of scientific procedures. Functional-structuralism is thus not a theory in the same sense as, for example, generalized relativity or generative theory. As André Martinet suggests, it represents nothing permanent; it is a "bundle" of realistic hypotheses (see Economie des changements phonétiques, pp. 33-34). Consequently, as a theory about linguistics, it does not envisage linguistic research as a science, but as one of the humanities employing scientific methods.

0.4 When the implications of the nature of language as outlined above have been understood, functional-structuralism can no longer be accused of being a "medieval" unscientific theory. Functional-structuralism starts with one hypothesis: linguistic economy. This principle explains the phenomena after they have been observed, or predicts future or unknown phenomena only in a probabilistic sense. For one thing, science (except, of course, mathematics, geometry, etc.; see below, 0.5) has always been probabilistic, although this does not seem to have been fully realized until Maxwell; but in physio-chemical sciences the probability is usually so high as to be considered as a practical certainty. In human sciences, however, it has been observed that, at best, one could hope to schematize a certain number of "scenarios," each of which branch off into a series of "possibilities." The number of possible "scenarios" for long-range predictions soon tends to become infinite in an exponential way. The degree of reliability of the prediction thus depends on the number of branches at a given point; this means, practically, that it is a function of its nearness to the "cause," or given state of the system. If this is true, two claims are confirmed: it is impossible to predict linguistic phenomena except in a probabilistic sense, and the best type of linguistic explanation consists in relating the observable phenomenon to the initial "cause," through a sequence of "choices" that, in turn, may be analyzed in terms of external constraints dynamically interwoven with functional (internal, "economic") factors.

The Basic Error of Generative Grammar

0.5 If, on the other hand, this is not true, functional-structuralism is false. If it is not the object, language, that is unpredictable, if it is only the theory that does not predict, this theory must be rejected as insufficient. Conversely, however, if language is not determined, then a theory which, like generative grammar, rests on this assumption, "falls into pieces."[8] This problem, which is "absolutely crucial for [Chomsky's] whole theory" (loc. cit.), has been studied by Hockett. As he puts it, "if languages are ill-defined, then the theory of computability and unsolvability ceases to have any relevance for linguistics, since this entire theory applies only to well-defined systems" (ibid., p. 61). Now, Hockett—after many others: virtually everybody until the advent of Generative Theory—observes that "all constraints in a language are of this more or less rubbery sort, yielding no definitive boundary to the 'set of all possible instances of the language'..." (loc. cit.). According to generative grammar, there is no such set, because of the recurrent properties of syntax. Hockett, however, believes that this is a mere epistemological confusion,[9] and that sentences infinitely long are not grammatically correct. Length, time and complexity must be taken into account in a definition of grammaticality, but these are "rubbery" constraints: there is no such a thing as a "longest" or a "most complex" sentence, or phrase-structure. Moreover, even if we forget this important ill-defined threshold of intolerable recurrence, there is no theoretical way to determine the grammaticality of a tolerably short and simple sentence. Clearly some sentences are correct and some are not, but the limit between the two sets is, once again, "rubbery," and becomes so more and more when social, geographic or diachronic factors enter the picture. Thus language is neither finite nor infinite: it is ill-defined; everything that starts with the assumption that it is well-defined is fundamentally mistaken.

The Failure of Generative Grammar

0.6 An odd result of this basic error is that it may compel generative grammar to take a stand which it criticizes in some other linguistic theories, namely that they are not even true (validly conceived and formulated) hypotheses as they are invulnerable. If it is maintained that language is well-defined (or deterministic) when all available evidence shows that this is not the case, then one may have to take comfort in the idea that it simply ought to be so at the deepest level, although this--by definition--cannot be apprehended as such, but only through the distorted and contingent appearance of the surface structures. At this point the idea is no longer a hypothesis, but a dogma. This type of answer has been foreseen by Hockett, who stigmatizes its consequences:

> The assumption [of well-definition of language] can be retained in the face of the evidence if one posits an obscure sort of 'underlying' system that by definition meets the requirements of the assumption, and then explains (or explains away) the vagaries of actual speech as due to the participation of other factors. But this step moves the underlying system completely out of reach of the methods of empirical science. The notion thereby ceases to be a hypothesis, and becomes merely idle speculation (p. 66).

If the well-defined sentence-generating machinery posited by generative grammar turns out to be illusory, then, inevitably, "the grammar of a language, in Chomsky's sense, simply does not exist" (p. 76). It may, at this point, appear more plausible to reject Chomsky's conceptions of language and grammar than to accept the idea that languages do not have grammars, or do not exist.

0.7 The ultimate defense-line set up by generative grammar might be: "Perhaps it is wrong, but at least it is useful; we have to proceed by trial and error, etc....." This reaction may appear slightly ironical, in view of the fact that Generative Theory claims to be deductive. Two comments must be made regarding this attitude. First, an idea must be rejected if it is wrong, even if it ought to be right in view of the fact that it is well "integrated" or that it once appeared obvious to a great many.[10] If it is only possible that it be wrong, however, it may be kept (see below, 0.13). But if it appears that generative grammar is fundamentally mistaken, it must be abandoned. Secondly, and this is probably more important since it is difficult to decide whether a theory is wrong or merely seems improbable, a theory ought to be judged according to what it can achieve. This idea may also seem difficult to accept for a mind used to Generative Theory, for this theory seems to be of the type that implies the attitude: "What has been done so far (outside Generative Theory) is all very well, but since it was incapable of accounting for all the data,[11] it finally accounts for nothing."[12] This radical attitude does not seem to reflect the scientific method (nor, for that matter, the history of Science). Usually, a hypothesis is rejected, not when it has been shown that it did not account for everything, but when a new one accounts for more. Thus the idea here expressed by Noel Corbett may be accepted: "The value of any analytical technique can be gauged only by the results accruing from its application."[13]

0.8 Corbett continues: "In diachronic phonology, the best method is the one that most cogently accounts for the attested facts" (loc. cit.). Some linguists have expressed serious doubts about the fecundity of generative grammar in diachrony. Hockett probably summarizes the experience and the present opinion of many when he recalls: "One of my main reasons for having become suspicious of Chomsky's views ... was that they appeared to be in conflict with what had been discovered about linguistic change" (The State, pp. 81-82). In synchrony (but, of course, in diachrony, this criticism is valid just as well) the main question is that of the status, or the reality, of the transformations exposed. Either they are linguistic processes, or they are not. If it is claimed that they are, this claim must be rejected on the basis of the observation that they cannot be, as they derive from a model that is essentially wrong (cf. above, 0.5). If they are not, what are they? It has been suggested that they were computational devices, i.e., that their real purpose was to facilitate computer programming of language.[14] Now, as Hockett puts it, algebraic grammar "is fun," and may be useful for some technical applications (*ibid*., p. 62, note 27). But technique and science are two different things, and must be kept apart. Another confusion here would be tragic if, as Hockett suggests, "the things left out of account in order to achieve an approximation of this particular sort [computational linguistics] are *just the most important properties of human language* ..." (p. 62).[15] One may thus conclude, with him, that this approach is irrelevant to linguistic research.[16] One may hope that it will not prove damaging.[17] Indeed, if Hockett is right in believing that the most important property of human language is its openness (*loc. cit.*) i.e., its escaping (at least internal) determinism, the so-called "mental" *a priori* well-definition of all its workings may appear dangerous.

Functional-Structuralism as a Plausible Alternative

0.9 In the framework of the "absence of theory" of functional-structuralism, two of its characteristics must now be examined: Is it a plausible hypothesis about language? Is it a scientific hypothesis, i.e., is it a vulnerable framework for particular explanations?[18] Paul M. Postal affirms, in his highly personal review of Martinet's Elements of General Linguistics, that functional-structuralism presents a patent "inadequacy [in its] underlying conception of language and approach to linguistics" (p. 152). In fact, on closer study, it appears that Postal shows the inadequacy of structuralism or distributionalism, which is based on a Watsonian-Skinnerian type of behaviourism. Functional-structuralism is not distributionalism, however, and has nothing to do with—or say about—behaviourism, or any other kind of psychological hypothesis regarding the nature or essence of language. This "theory" is not a plausible hypothesis about language simply because it is not a hypothesis about language at all. Functionalists do not feel ashamed of admitting this any more than physicists feel ashamed for not having a theory of the physical universe; there seems to be no need for this type of essentialist proposition today, at least in science.

0.10 We are concerned with function. How do languages work and evolve? It is only the functional principle of economy, which constitutes the hypothesis, the vulnerable framework for particular explanations, that will be briefly discussed here. The principle of economy proposes to explain the observable linguistic phenomena by two conflicting needs: the need to be understood, and the need to burn as little energy as possible in doing so. This applies in synchrony as well as in diachrony. It has been suggested that people attempt to make themselves understood in the simplest way possible: this implies simple constructions, concision, easy articulation, etc. Beyond a certain point, however, hypersimplicity leads to oversimplification, concision tends to become obscurity, relaxed pronunciation may end up in inaudible, slurred and altogether incomprehensible speech. An enunciation that presents these defects and is not understandable will not "function." The speaker, if he wants to make his point, has then to repeat himself a little more understandably: he may start again in a louder voice, use a better word or a simpler construction, or articulate more clearly. In diachrony, a "manner of speaking" that does not get the message across will be eliminated in the same way: ambiguous terms or expressions, unclear constructions, etc. are ceaselessly evacuated from normal use. Redundancies are ceaselessly eroded as well; too much is eliminated as well as too little.

0.11 It appears practically impossible to predict linguistic evolution; indeed it makes sense afterwards, but cannot be predicted. However, the hypothesis of functional-structuralism circumscribes the aim of linguistic research stricto sensu: determing how a particular phenomenon may have been caused by a dynamic interaction of the two needs outlined above. Many changes, it seems, are "explained" in this sense. But many are not, and it seems that most changes (if not all) are influenced by pressures that are external to the two needs. Functional-Structuralism also attempts to determine the impact of these external phenomena, and to relate them with the internal economy of the development under study. Is the principle of economy, then, a scientific hypothesis? The answer is yes, in spite of the fact that linguistic economy cannot be observed. It does, however, inspire "bundles" of realistic hypotheses concerning particular phenomena that appear explained thereby more than by any other type of reason. The functional-structural hypothesis is vulnerable: if a change, whose origin could not be traced to any external influence, displayed uneconomical characteristics, it would wreck the hypothesis.

0.12 At this point, a generative grammarian might protest, on the grounds that this pseudo-vulnerability merely rests on the wholly unknown notion of "uneconomical characteristic." It is true, conversely, that some changes appear uneconomical, although they do not seem to be due to an external influence; if the hypothesis is to survive, it will have to be shown that, in a way still unknown today, they fulfilled a functional need of the linguistic tool. This notion of functional need should perhaps be modified, broadened--which could be done without abandoning anything essential. The ludic function of language, for example, probably does not invalidate the principle of economy.

There are other difficulties with functional-structuralism in its present state. Corbett observes that "most of [Martinet's] crucial assumptions have been challenged, and many have been refuted" ("Review Article," p. 274). The best example (perhaps the only one) of a functional notion that seems to have been refuted is that of the importance of functional yield as a factor preventing phonological merger (see King, "Push Chains and Drag Chains," pp. 4-17, Knud Togeby, "Les Explications phonologiques historiques sont-elles possibles?" p. 404, Corbett, loc. cit., etc.). It may have to be seriously modified, or perhaps abandoned. Many other notions of functional-structuralism (importance of the paradigm, core-systems, relationship in the number of orders and series, etc.) seem shaky at present; it has, so far, proved difficult to substantiate them decisively, and in numerous cases they seem not to have worked. In many, perhaps more numerous cases, however, they seem to have offered a very plausible explanation, perhaps superior to all others. At any rate, functional-structuralism ought not to be rejected because it contains difficulties, and because many of its concepts are still tentative (and have been challenged).[19]

0.14 Functional-structuralism has been chosen for this study for the reason that it seems to be the framework best geared to describe the interactions of phonic units, both in the syntagmatic and in the paradigmatic structures. The concepts, methods and procedures of this theory may be more elaborate than those of any other as regards describing the relationship of the units, either of a given phonological system, or of an evolving system.[20] Besides, all the notions pertaining to phonological space are founded on phonetic realities; in effect they are inseparable from them--they merely interpret them in the light of each particular system. Finally, as parts of the evolutions discussed are unknown, it appeared necessary to attempt to reconstruct the changes with the help of philological techniques; perhaps functional-structuralism is the framework best equipped for synthesizing the contributions of philology and linguistics into a "bundle of realistic hypotheses" acceptable to most students of language.

NOTES TO THE INTRODUCTION

[1] For an outline of this theory at the phonological level, see below, 4.1. It is the foundations of the theory that are discussed here.

[2] Schleicher writes, in La Théorie de Darwin et la science du langage, p. 5: "Tandis qu'autrefois on s'empressait d'abord de faire un système et qu'on s'efforçait ensuite de ramener les objets dans le système, on procède aujourd'hui tout au rebours. Avant tout on se plonge dans l'étude particulière et précise de l'objet, sans penser à une construction systématique du tout. On supporte avec le plus grand calme d'esprit le manque d'un système philosophique correspondant à l'état de nos recherches particulières dans la conviction que pour le moment un tel système n'est pas encore possible, et qu'on doit éviter d'essayer de l'établir."

[3] "Proofs and Refutation," p. 303. This is, in condensed form, the heuristic theory proposed today by Karl Popper. See, for example, The Logic of Scientific Discovery, p. 27: "From a logical point of view, we are not justified in inferring universal propositions from particular ones ... it does not matter how many white swans we have been able to observe, that does not justify the conclusion that all swans are white." This idea is not new: one finds it in Albert Einstein, Albert Einstein Philosopher-Scientist, p. 49, and long before, in Claude Bernard, Introduction à la médecine expérimentale, p. 557.

[4] "Linguistique structurelle et philosophie des sciences," p. 119.

[5] Perhaps one may consider the following passage as an example of this type of criticism; Jean Cantineau is reviewing Zellig S. Harris, Methods in Structural Linguistics, p. 5: "Nous sommes loin de la minutie et de la prudence qui font la valeur de la Grammar of the Phoenician Language; c'est que depuis lors la Méthode Linguistique a été révélée à Z.S. Harris; il couche les faits dans une sorte de lit de Procuste; s'ils ne s'en accomodent pas, ils ont tort; on les y adaptera de force. [...] Mon impression générale est que Z.S. Harris applique sa méthode d'une façon mécanique, sans tenir suffisamment compte des faits." The oddity of the situation is that Cantineau is himself an admirer of Trubetzkoy's, and that these lines criticizing a structural work could be used today by structuralists criticizing generative findings.

[6] Michael Polanyi, "Science and Reality," distinguishes three attitudes in the history of Western science. The medieval attitude consists in relating reality to some first principles without the (scientific) intermediary of hierarchized and indirectly observable "laws" (p. 178). This attitude is opposed to the Positivist and the Copernican ones. The Positivist approach is interested only in these "laws," and does not pretend either to attain reality nor to be ever able to explain it by first principles. The Copernican approach claims to explain reality by first principles, through laws. One may risk the analogy according to which these three attitudes have been adopted in linguistics by functional-structuralism, distributionalism and

transformationalism, respectively. But see the discussion below, (0.4).

[7] Besides, even in science, Michael Scriven observes, the principle of (complete) determinism is difficult to use except as a methodological a priori; the hank of causality is too complex. "People have sometimes argued that if A really is the cause of X, it must always be followed by X. This is to confuse causes with sufficient conditions, and practically to abolish them from the applied sciences, since there are almost no absolutely reliable statements of sufficient conditions there" ("Explanation and Prediction in Evolutionary Theory," p. 482; quoted by Ardon Lyon, "Causality").

[8] Charles F. Hockett, The State of the Art, p. 57.

[9] Hockett, ibid., pp. 54-55, gives the example of propane. "The fact that the set of all formulae for hydrocarbons of the methane series is a well-defined system is a discrepancy between notational system and reality." In reality, molecules of propane become unstable when they become long; the longest possible real molecule of propane does not exist. The series is, thus, in reality, ill-defined. The epistemological confusion would consist in deciding that it is well-defined simply because the formulae used to comprehend it constitute a well-defined system. Hockett warns (p. 83): "Even if our work is very expertly done, we must not promote our more or less standardized by-and-large characterization of the language to the status of a monolithic 'ideal,' nor infer that because we can achieve a fixed

characterization some such monolithic 'ideal' exists, in the lap of God or in the brain of each individual speaker." A worse kind of confusion would imply that the "ideal" grammar exists in the brains of all the speakers of the language; worse still, and totally unscientific, would be the idea (outlined below, 0.6) according to which this grammar should exist and must be the object of linguistic research.

[10] In this respect, the fact that structuralism now appears "slightly outmoded" (Noel Corbett, "Review Article: Luigi Romeo, The Economy of Diphthongization in Early Romance," p. 273) and is now "widely regarded as obsolete" (Marilyn M. Vihman, "Review of Roger Hadlich, The Phonological History of Vegliote," p. 622) cannot be used as an argument against it any more than the popularity of Generative Theory seriously supports it. Fashions are good when they popularize new ideas, but they are harmful when they become tyrannical and prevent the development of other (old as well as new) ideas.

[11] Rudolf Botha, The Function of the Lexicon in Transformational Generative Grammar, p. 112, criticizes theories, such as Hockett's, which refuse to pretend that everything must be accountable for in scientific terms. He declares that "what are 'fuzzy edges' or 'marginal uncertainties' within the framework of one linguistic theory, are explicable by the grammatical apparatus of another (type of) linguistic theory containing more fruitful theoretical principles." This attitude is valid only if one believes, with him, that "no 'uncertainties' lie in the nature of language" (loc. cit.). Since

this belief is erroneous, however, the condemnation on which it rests is mistaken. One may well observe, in the shadow of Generative Theory, linguistics "evolving from a humanity into a science" (Anthony G. Oettinger, "Linguistics and Mathematics," p. 179); there may be "a growing recognition of languages as natural phenomena whose secrets may yield to methods of analysis and discription akin to those that have proved fruitful in the physical sciences" (loc. cit.)--this will change nothing in the fact that language is not well-defined like mathematics, and not so simple as physico-chemical processes. Because language is what it is, and not because some linguists are incapable of understanding and applying "scientific" (or scientific-looking) procedures and terminology, linguistics "need not have any illusions about the possibility of competing in scientific rigour with disciplines that deal not with people but with things ... and will no doubt continue in the foreseeable future to secure the allegiance of academic minds" (T.B.W. Reid, "Historical Philology and Linguistic Science," quoted by Kurt Baldinger, "Traditionelle Sprachwissenschaft und historische Phonologie," pp. 534-535). Why only "in the foreseeable future"? Are languages going to become well-defined some day? Or are they going to degenerate and become subject to the influence of fewer and fewer parameters? This reservation seems odd; it seems that one can confidently assert, with Meillet, "Review of Hugo Schuchardt, Der Individualismus in der Sprachforschung," p. 13. that linguistics is one of these sciences "où ... le tact, le jugement porté sur des faits complexes qui échappent au calcul interviennent sans cesse." This is simply due to the intrinsic nature of language, which Hockett compares with "Sandlot Chess," where "in the formal sense, there are no rules--only a changeable consensus" (The State, p. 86). This had been correctly seen by Pierre Guiraud, "Les Structures aléatoires de la double articulation." While he is, like Hockett, a specialist in mathematics and computational linguistics, he similarly arrives at the conclusion that natural languages "échappent à la rigueur de nos lois aléatoires" (p. 154). It is not because he is fighting a system of thought which he finds mistaken, but simply because he has observed it, that he states: "C'est qu'en linguistique il n'y a pas de lois, mais des faisceaux de tendances" (loc. cit.; emphasis added).

It may be added here, that this absence of internal determinism in (psycho-) linguistic processes does not imply absence of universal determinism, Laplacean determinism. Denis Diderot, Le Neveu de Rameau, p. 241, explains this in the simplest terms: "[DIDEROT] Nous ne faisons qu'énoncer des phénomènes conjoints, dont la liaison est ou nécessaire ou contingente ... nécessaires en mathématique, en physique et autres sciences rigoureuses; contingents en morale, en politique et autres sciences conjecturales [= psychology, sociology and other human sciences]. D'ALEMBERT Est-ce que la liaison des phénomènes est moins nécessaire dans un cas que dans un autre? DIDEROT Non; mais la cause subit trop de vicissitudes particulières qui nous échappent, pour que nous puissions compter infailliblement sur l'effet qui s'ensuivra." Also see ibid., p. 320: "[BORDEU] Après cela je ne vous dirai de la liberté qu'un mot, c'est que la dernière de nos actions [= our finest decision] est l'effet nécessaire d'une cause une: nous, très compliquée, mais une."

[12] Generative Theory is ambitious; it seems to want to account for everything. This may be the logical result of its claim of well-definition. If it wants to account for languages totally, it may have to look for its defining (or generating) devices in the speakers' brains ... and lives. So far it has not explicitly proposed a new Theory of the Universe, but logically it should not stop until this has been achieved, since, apart from some mental creations (among which natural languages are not), the only well-defined entity in the universe is the universe—perhaps (cf. Diderot, *ibid*, pp. 269-270 *et passim*, Hockett, *The State*, p. 57). But generative grammar has busied itself with philosophy and psychology (see, for example, Jerrold J. Katz, *The Philosophy of Language*). Such essays recall the treatises of the early 19th century, e.g. *De l'Existence du genre neutre dans la langue française considérée comme un nouveau moyen de parvenir à l'analyse du langage*, by M. Maublanc aîné. L. Jonathan Cohen, reviewing Katz's work, p. 165, concludes that "there are many ways in which philosophy and linguistics can help one another—but not by seeking to solve each other's problems." By attempting to explain too much, some generative linguists seem in fact to have been able to explain very little; not infrequently the new school has been accused of merely rephrasing past discoveries (see, for example, Witold Mańczak, "Quelques Réflexions sur la doctrine de Noam Chomsky," p. 22,

and Winfred P. Lehmann, "Review of Yakov Malkiel, Essays on Linguistic Themes, p. 285). Often, generativists have reintroduced, under a camouflaged terminology, concepts that the doctrine had first criticized, or even continues to ridicule; cf. for example, Morris Halle's discussion of the allophones of the Kabardian vowel-phonemes, in "Is Kabardian a Vowel-less Language?" p. 96, or A. Campbell's review of Robert D. King, Historical Linguistics and Generative Grammar, p. 204: "If any claim containing the statistical qualifier "tend' is usually so weak as to be valueless' [King, p. 193], then why is appeal to markedness, a formalism of 'tendencies,' an explanation of anything?"

[13] "Review Article," p. 273.

[14] See, for example, Hockett, ibid., p. 62 and note 27, and Bernard Pottier, "La Grammaire générative et la linguistique," p. 11: "Qu'on veuille bien dire plus nettement que la programmation s'en trouvera facilitée"; this reflects no linguistic simplicity or real linguistic knowledge. As Pottier himself observes elsewhere ("Review of Sol Saporta and Heles Contreras, A Phonological Grammar of Spanish," p. 129), "Dans ces conditions, [such a type of study] devient une technique pour machine et non plus un essai linguistique." Cf. also Giuseppe Francescato, "Review of Noam Chomsky, Syntactic Structures," p. 66.

[15] This leads to a dramatic impoverishment of linguistics instead of a renewed insight; this is why Francescato, ibid., p. 67, describes the computational approach in such terms as "limitazione pregiudiziale, aprioristica ... ámbito pregiudizialmente limitato." Also see Kurt

Baldinger, "Diskussion aktueller Probleme," p. 480, note 1.

[16] Pottier, "Review of Saporta and Contreras," p. 129, similarly concludes that the usefulness of such an approach "n'apparaît pas clairement."

[17] A fear that it might be so is expressed by Pottier, loc. cit.; he suggests that one may be tempted, in order to facilitate the programming, to distort the real linguistic functioning.

[18] It is here considered that these two questions have been answered, negatively, for generative grammar. Generative theory does not seem to constitute a plausible hypothesis about language (in effect it seems to constitute a false hypothesis) unless it ceases to be a scientific hypothesis (cf. above, 0.5-0.6).

[19] Kepler's (or Newton's) concept of gravitation was criticized in his time because it seemed impossible that objects that did not touch in any way should attract one another as though they had ghost-like fingers. One still does not know how gravitation works. Yet it is a hypothesis that nobody today suggests should be abandoned.

[20] Of the linguistic levels studied by generative grammar, perhaps phonology is the least satisfactory. This seems to be due to the discrepancy between the model and linguistic reality, a discrepancy which, logically enough, appears widest at the level where mental realities merge with physical realities: articulatory, acoustic and auditory features. Applied to phonetic realities, the well-defined model appears particularly inadequate. The necessarily

discrete symbols used to denote ill-defined phonetic "zones" are used by generative phonology (e.g., Chomsky and Halle, The Sound Pattern of English, King, Historical Linguistics and "Push Chains") to represent really discrete units. This erroneous conception perhaps stems from Roman Jakobson, Gunnar M. Fant and Halle, Preliminaries to Speech Analysis. At any rate it should not be surprising if one considers language to be well-defined; if language is well-defined, it cannot include continuous (non-discrete) realities. This, however, is unacceptable. Phonetic realities cannot be discrete since they are physical. For example, one can distort the articulation of words to the point of unintelligibility. This point is not well-defined and, as a result, the phonetic range that defines a given string of formatives is not well-defined either. In practice, generative phonology is thus incapable of handling such a crucial reality in language—and particularly in language change—as an (ill-defined) set of allophones. (It may be added that functional-structuralism handles this with the various concepts of "allophonic range of variation," "margin of tolerance," etc.) Incapable of handling continuous realities, generative phonology is "completely bankrupt" (Hockett, The State, p. 2).

CHAPTER ONE: PALATALIZATION IN GALLO-ROMANCE

1.1 Palatalization is the sound process whereby the point of articulation is shifted to the hard palate and the mediolingual zone.[1] For a dental, it is thus a movement backward, whereas for a velar it is a movement forward. For example, English /k/ is palatalized in *keep* as it has a more frontal point of articulation than in *cool*; and conversely, /t/ is palatalized in Brazilian Portuguese *tío* as its point of articulation is further back in the mouth than in *tu*. Palatalization would be completed if the /k/ in *keep* and the /t/ of *tío* became phonetically similar, articulated on the middle of the palate by the middle of the tongue, i.e., if they merged as the palatal [c].

1.2 In a palatalizing process, the lingual point of articulation tends to become the middle (of the dorsum, or back) of the tongue. The tongue in effect takes the point of articulation of the vowel [i], or of the semi-vowel [j] (English t*ee*n, *y*ou). A palatal consonant, [c], [ɟ] or [ɲ] (Belo Horizonte Portuguese *t*ío, *d*ía, French ba*gn*e) is in fact an occlusion at the point of articulation of [j], or *yod*. For this reason, palatalized consonants are as though "softened" by gliding [i]-sounds (*yod*-transitions), and have been called *mouillés*, and their characteristic *mouillure*.[2]

The nuance in meaning between palatalization and *mouillure* seems to be one of viewpoint. Palatalization is dynamic or diachronic ("modification subie") whereas *mouillure* is synchronic ("articulation caractérisée"). The two words are practically interchangeable, but the former will be preferred, since it usually refers to diachronic realities, and is phonetically clearer.

1.3 Palatalization has often been confused with another linguistic phenomenon, assibilation, which resembles it, but which does not seem to have taken place in the evolution that led from Latin to Old French. A palatalization is not a direct assibilation of dentals before front vowels (and/or *yod*), for the reason that the latter does not imply a change in point of articulation, i.e. a shift to the palate, but affrication of the consonants at their own (alveolar or dental) point of articulation. Such assibilation of dentals did not take place in Latin, Vulgar Latin, Romance or Old French, since dentals before front vowels are still dental occlusives today: Latin DICERE, DECEM, TITIONEM, TEMPVS, etc. are *d*ire, *d*ix, *t*ison, *t*emps. On the other hand there was palatalization, followed by affrication (and later by depalatalization and deaffrication as well) as there was an early merger of dentals before *yod* and velars before front vowels and *yod*: RATIONE > rai*s*on, in the same way as RACEMV > rai*s*in, HORDEV, ARGENTVM > or*g*e, ar*g*ent. Many languages today exhibit one or the other of these two phenomena; some combine true palatalization with true direct assibilation. But the two processes must be kept apart; a confusion would endanger a proper understanding of either development.

An Example of the Confusion

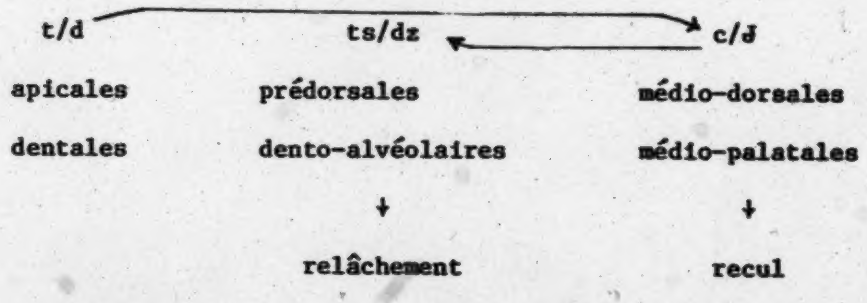
1.4 Modern French Canadian shows assibilation. In Quebec, one pronounces tirer, tuer, dire, Dieu, etc., as [t^sire, t^sye, d^zi:r, d^zjø], i.e., one actualizes dental phonemes before high front vowels and yod as dental affricates, phonetically similar to those in German zehn, zu, Italian zio, prezzo, or Parisian French tsigane, tsar. This pronunciation is observed by René Charbonneau: "Faisons prononcer l'occlusive dentale [t] suivie de la voyelle palatale [i] par un Canadien-français. Qu'entendons-nous?' [tsi]'. Comment expliquer ce phénomène acoustiquement?"[3] The question that Charbonneau's investigation attempts to answer is this: "comment expliquer le développement d'une sifflante ou d'un élément sibilant au cont[illegible]t du [t]?" (p. 14). His fundamental hypothesis is that a palatalization took place. He schematizes it (p. 7) as (fig. 1):

Figure 1: Palatalization 1

t/d	⟶	c/ɟ	⟶	ts/dz
apicales		médio-dorsales		prédorsales
dentales		médio-palatales		dento-alvéolaires
		↓		↓
		recul		relâchement

1.5 This scheme is misleading, as it gives the impression that there is a continuous move backward, in the point of articulation, from t/d to c/ɟ and from recul to relâchement. This is not the case, as is indicated by the articulatory descriptions, apicales, médio-dorsales, etc. In effect a true representation of the various points of articulation, the known ones [t/d, ts/dz] and the hypothetical one [c/ɟ], would be (fig. 2):

Figure 2: Palatalization 2



In this scheme, the move backward that Charbonneau postulates appears unlikely and unnecessary. A homorganic affrication of [t,d] would result in [ts,dz] without any palatalization, as neither the dentals nor the alveodentals are articulated on the palate. And if relâchement (affrication) had taken place at the point of articulation postulated in the phonetically unstable mediopalatal area [c,ɟ], the result would be [tʃ,dʒ] today; this is not the case. Charbonneau realized the awkwardness of his hypothesis, since he remarks: "il ne faut d'ailleurs pas être étonné du rapprochement [t + s], si l'on considère leurs points d'articulation, tous les deux dentaux" (p. 15). It is not the rapprochement [t + s] that should be astonishing, but rather the postulated backward and forward movements of the articulation to and from the palatal area. These hypothetical movements are described in odd terms:

> Nous avons mentionné au tout début que [t] et [d] pouvaient, par un déplacement qui tend a reporter l'articulation vers les dents, passer aux mi-occlusives. La langue s'est donc en quelque sorte et de nouveau relâchée au point de vue musculaire. Elle s'est décollée progressivement de la voûte palatale, c'est-à-dire, de la partie la plus élevée du plafond buccal, et a fait avancer l'endroit du contact vers les dents (pp. 14-15).

1.6 At this point, after having observed the articulatory nature of [i], [t] and [s] described respectively as the most frontal vowel, dental and alveodental consonants, Charbonneau tentatively concludes that the three sounds share some features. This explains their articulatory interaction in the palatalizing process. However, the mechanics of this interaction are difficult to grasp, since the fact that [i], [t] and [s] have some common features does not seem to clarify the palatalizing process in this development. Charbonneau then analyses his collection of palatograms, showing the points of articulation of dentals in various environments, as they appear in the pronunciation of Canadian informants. It is not until this has been completed that he realizes the discrepancy between this observable evidence and the palatalization hypothesis. His palatograms show no tongue-palate contact. He thus concludes that there was no palatalization preceding affrication (pp. 139-140).

1.7 Yet, since the French Canadian assibilation of dentals before high front vowels has traditionally been called palatalization, Charbonneau feels compelled to contradict himself by admitting that there must have been a mouillure at an earlier stage, in the 17th century. The change from a palatalized dental to a hissing affricate is explainable by a great similarity at the acoustic level (pp. 143-144). No other argument is given to support the claim that there was a palatalization in the 17th century. Apart from acoustic similarity, no argument is given to explain and justify his hypothetical change [c > ts], which is a change seldom observed (see below, note 42).[4] Consequently, Charbonneau's résumé and conclusion reflect a contradictory position. In a study entitled *La Palatalisation*, the title of the first paragraph is 'Absence de palatalisation' and paragraph 2 is 'Assibilation': "Au lieu de la palatalisation (c'est-à-dire comme un produit historique d'une évolution), nous constatons une assibilation" (p. 145), whence his remark: "Le titre de la présente étude doit donc s'entendre exclusivement sur le plan diachronique" (p. 146). The wrong term attributed to the French Canadian assibilation has prompted Charbonneau to repeat an unsupported hypothesis, and to account for it in a contradictory way. This contradiction was noted by André Martinet, who, in his review, questions why the author discusses palatalization since there is none in synchrony; and, as far as diachrony is concerned, there is no proof that there was any.[5]

A Dubious Argument

1.8 The example of the French Canadian assibilation thus does not argue against the probability of a hushing stage (see below, Chapter Two) in the development of the Latin palatalization, since the two processes are distinct. On the one hand there is—as in many Creole dialects and in a certain aristocratic accent of Paris: *voit*^{h}*ure*, *voit*$^{\theta}$*ure* or *voit*^{s}*ure* for *voiture*, etc., as well as in Modern Greek, for example—a direct assibilation of dentals before high front vowels and *yod*. And on the other hand there seems to be a palatalization of dentals and velars before *yod*, of velars before front vowels, and, at a later stage, of velars before front vowels and /a/, and labials before *yod*. In the first case, there is no change in point of articulation involved: [t], [ts] and [s] are "homorganically" alveodental, and from [t] to [ts] a simple affrication results in a sibilant (or hissing) sound. The fact that in French Canadian this affrication occurs only before *yod* and front vowels does not make it a palatalization; a similar affrication of unvoiced occlusives in High Old German transformed voiceless dental stops into hissing affricates: *zehn*, *Zahn*, *zu*, etc. In the second case a real palatalization is involved since the point of articulation of the consonantal clusters indicated above was shifted to the palatal area, where the previous dentals and velars merged, at the point of articulation of *yod*. This is suggested by many types of phonetic, linguistic, and historical criteria (cf. below, 2.2; and Chapters Two and Three). And it is at this palatal point of articulation that, most probably, affrication took place.[6] Thus the hissing reflexes observable in Francien, as well as in many other Romance dialects may be the result of a *secondary* development, posterior to their affrication; an "indirect assibilation."

Direct Assibilation and Palatalization-Affrication: The Relationship Between the Two Processes

1.9 Direct assibilation and palatalization-affrication are different processes, and should be envisaged as such. They usually appear at a different time, but they may also occur simultaneously in a given language. The phonological syntagmatic context that permits them is usually different. Direct assibilation ordinarily develops with dental occlusives before front, usually high front vowels and *yod*, exceptionally before *yod* only.[7] In direct assibilation the *yod*, where there is one, is still there when the process is completed: in French-Canadian we have *dzire* for *dire* and similarly *Dzieu* for *Dieu*. Palatalization usually is the result of a process of regressive assimilation (anticipation). In the majority of cases, the consonants are followed by *yod*, frequently by *yod* and high front vowels, and occasionally by *yod* and front vowels (as in Gallo-Romance). It is sometimes the result of a process of progressive assimilation, in which case the palatalizing element is the same as in the previous phenomenon, but precedes the consonant. Since the essence of the phenomenon is the shift of the consonant or cluster towards the point of articulation of the attracting vowel or *yod*, the result, at one point, is a palatal consonant. It is from that stage that things may develop in various ways. When affrication takes place, which is by far the most frequent development (cf. note 6), the *yod*, being "inside" the (palatalized) consonant, does not appear as such in its affrication, but as a palatal friction. If, for example, the same *d* + *j* cluster, as cited above to illustrate assibilation, undergoes palatalization and affrication, the process is Dieu, [ɟø], [ɟʑø], [dʒø], where there is no *yod* left. On the other hand the two processes may converge. The *Dzieu* [dzjø] of French Canadian may then undergo palatalization, and thus develop the palatal cluster [dʒ], where again the yod is swallowed. And conversely, the [dʒø] of some Modern French dialects and regional pronunciations of French may then undergo indirect assibilation, and end up as [dzø]. The major, indeed, cardinal difference between this and the first stage of direct assibilation is that the yod, here, has disappeared altogether. The two theoretical processes,[8] in the same environment may be schematized as (fig. 3):

Figure 3: Assibilation and Palatalization

	direct assibilation	palatalization	indirect assibilation
	dzjø	dʒø	dzø
djø	ɟø	ɟzø	dzø
	palatalization	affrication	indirect assibilation

Origin of the Confusion

1.10 The first of the two reasons that explain the confusion of the two processes is that the phonetic contexts that permit them may be the same. Such was the case with the preceding example. But high front vowels may be a sufficient phonetic inducement to palatalize preceding dentals. This is what happened in Vilela, and in Brazilian Portuguese, for example.[9] On the other hand, velars cannot undergo direct assibilation: from the velar to the alveodental area they would have to cross the palatal region, i.e., palatalize. The second reason is that in practice yod and [i] are often confused in linguistics. For example A. François writes that in 18th century

French: "k et g palatalisés devant e, i, u tendaient à déplacer leur point d'articulation."[10] Apart from the fact that the point of articulation of velars before front vowels in Modern French is undoubtedly slightly more frontal (postpalatal, usually) than before back vowels, there was, in postclassic French, no palatalization in the usual sense of the word except before yod, where it was indeed very frequent.[11] Meillet detected this confusion and, in his review of this study, observed that no palatalization occurred before e, i, u, but only before yod (pp. 79-80).

PALATALIZATION IN GALLO-ROMANCE

1.11 Why is a palatalization supposed to have taken place in the evolution that transformed Latin into Old French? To modern linguists the most economical--or simplest--way to account for the metachronic equivalences FORTIA = force, FACIA = face, VICINV = voisin, CAREV = char, PROPIV = proche, etc., was through a palatalizing stage that would transform the palatalized clusters into affricates first, then fricatives. A process of direct assibilation does not appear to have taken place, for the reasons that velars merged with dentals, that the post-consonantal yod has disappeared--in all Romance dialects--and that a parasitic i was disengaged (see below, Chapter Two, note 41). Besides, apart from Rumanian and Modern French dialects (including those of Canada and Louisiana, and Creole dialects) no Romance dentals have been affected by following high front vowels. It is possible, however, to conceive of a process of palatalization that would lend hissing results without the frequently observed hushing stage. Many Romance scholars have suggested that the Vulgar Latin palatalization precisely followed this "hissing channel."

NOTES TO CHAPTER ONE

[1] See Jules Marouzeau, *Lexique de la terminologie linguistique*, p. 165: "Modification subie par un phonème dont l'articulation se trouve reportée dans la région du palais dur, ainsi par le mouvement qui rapproche du palais la partie médiane de la langue."

[2] See *ibid*., p. 152. *Mouillure* is an "articulation caractérisée par un léger frottement de l'air contre l'obstacle imparfait que constitue la partie molle (particulièrement le dos) de la langue rapprochée de la partie supérieure de la cavité buccale ou palais... ."

[3] *La Palatalisation de t/d en canadien-français*, p. 14. (Why *acoustiquement* only? Is it not also an articulatory phenomenon?) It is suggested that Charbonneau's excellent investigation leads to unsatisfactory conclusions because of the *a priori* conception that the phenomenon under study is a palatalization.

[4] The acoustic similarity [c - ts] is far less than that found between [c - cś - t] and [t - ts]. Thus the posited palatalization appears acoustically as well as articulatorily unjustified.

[5] Page 102. Unfortunately, not only is that historical hypothesis still advanced, but the synchronic confusion--which Charbonneau's palatograms had shown to be wrong--seems generally admitted. Jean-Denis Gendron, *Tendances phonétiques du français parlé au Canada*, and William Sayers, in his recent review of Gendron's book, for example,

talk about palatalization; Sayers, for instance, writes: "C[anadian] F[rench] treatment of alveolar and velar occlusives is no less characteristic: *t* > *ŝ*, *d* yield *ẑ* before i, u, y, ẅ and become *palatals* before most other front vowels..." (p. 632; emphasis added). Why should the alveodental [ts] of French-Canadian be any more *palatal* than the phonetically similar [ts] of German *zehn*, *zu*, *Zug*, etc.?

[6] At this point, one might consider Jacobus van Ginneken's observation to the affect that palatal occlusives usually affricate in hushes ("La Biologie de la base d'articulation," p. 306): "La forme affriquée des consonnes est accouplée dans beaucoup de langues à la localisation au milieu de la bouche [in the mediopalatal zone]. Si maintenant par hasard une occlusive vélaire s'avance dans la bouche, ou si une occlusive dentale se retire dans la bouche, toutes les deux à l'instant se transforment en une affriquée. Et c'est par là qu'on peut expliquer que beaucoup de langues n'ont pas d'affriquées labiales, dentales ou vélaires, mais seulement des affriquées palatales."

[7] Some Modern Greek dialects seem to have that environmental restriction (see André Mirambel, "Le groupe *ts* en grec moderne.") Direct assibilation can also be, as in German for example, the result of an affrication of occlusives; in which case dental occlusives become [ts, dz] in the same way as labial and velar occlusives become [pɸ, bβ] and [kχ, gγ] respectively. But this is more unusual.

[8] Palatalization may follow (or occur at the same time as) direct assibilation. Many Creole dialects seem to exhibit both processes at present. Viet-Namese which has Diem [dzjɛm = zjɛm] at the same time as Cha [ca, cʃa, cša] may have undergone them conjointly in a recent past; Russian, and Slavic languages in general, as well as Rumanian, have known both phenomena in their phonological history. A particularly clear case is that described by Hosea Phillips, Etude du parler de la paroisse Evangéline (Louisiane). In this patois, spoken by 25,000 people (in 1935), direct assibilation explains the pronunciation tsu, tsire, dzeu, dzire for tu, tire, deux, dire, etc.; but at the same time it is palatalization that caused pitié, inquiet, qui, culotte, queue, to be pitché, intchet, tchi, tchulotte, tcheue.

[9] See José Pedro Rona, Nuevos elementos acerca de la lengua charrúa, p. 23.

[10] In Ferdinand Brunot, Histoire de la langue française, IV, 2: La Langue postclassique, p. 11.

[11] Cf. the examples in Molière: Guieu, [illegible]ugué are given as a peasant pronunciation in some of his plays (see, for example, L'Ecole des femmes, acte II, sc. II). There is no example of *guire, *quirer for dire, tirer.

CHAPTER TWO: CHANNELS OF DEVELOPMENT OF PALATALIZED CONSONANTS: THE CRITERIA OF CHOICE

THE RANGE OF OPINIONS

Diez, Ascoli

2.1 One of the major problems dividing scholarly opinion almost from the beginning of Romance studies concerns the channels of development followed by palatalized consonants and clusters.[1] Diez postulates that the Vulgar Latin palatalized consonants whose reflexes are hissing today took the sibilant form as soon as they affricated. The dialects which now show hushing sounds genetically corresponding to hissing ones in most Romance languages must have had an originally hissing stage: "en italien et en valaque du nord ce ts s'épaissit en ć; dans les langues de l'ouest il se détermine comme un simple son sifflant."[2] Schematically, this process can be described as:

                                        > hiss
palatalized consonant > hiss
                                        > hush

or

          > ts
c > ts
          > tʃ

For example, Latin CAELV becomes *['cɛ:lo], then *['tsɛ:lo]; and subsequently remains [tsiɛl] or ['tsiɛlo] in Old French or Old Spanish, while it "thickens" into ['tʃiɛlo] in Old Italian, Northern Valachian and Norman-Picard.

At the other extreme, Graziadio Isaia Ascoli sees in the medio-palatal hushing forms still attested by most Central Italian dialects a direct evidence for "qual fondamentale continuazione romanza di CE latino."[3] Ascoli's channel may thus be schematized as:

$$c > t\text{ʃ} \begin{array}{l} > ts \\ \\ > t\text{ʃ} \end{array}$$

The argument he advances to support this hypothesis, apart from phonetic probability and dialectal evidence, is the presence of what was to be called the *parasitic i* in languages which have hissing forms today, French for example:

> L'*i* delle forme francesi sulla stampa di paix (páis) va tra i più sicuri indízj che le sibilanti franco-provenzali (*s* ecc.), le quali ora continuano il *c* di CEL CI, sien passate per la fase palatina e palatile (ć, ǵ, ecc.)... (*ibid.*, p. 86, note.).

Schuchardt

2.2 Hugo Schuchardt arrives at conclusions parallel to Ascoli's. He too suggests that the channel of development of palatals must have contained a hushing stage; palatal affrication results in a hush. The two Gallo-Romance developments are apprehended in relationship with one another. It is the fact that they did not start at the same time that explains the discrepancy of the results:

> ...[[tʃa] < *ka*] est postérieur à *ce*, *ci*. Même en laissant tout à fait de côté le fait que *çe*, *çi* sont communs à tout le domaine roman et qu'on trouve de bonne heure des exemples dans les textes, cette postériorité résulte de la comparaison des développements historiques de *ç* et *ć*:
> ç: ky, ty, tx, tch, ts, s;
> ć: - - ky, ty, tch, ch.
> *C* devant *a* et *c* devant, *e*, *i* se développent dès le principe d'une manière tout à fait semblable; si le changement avait commencé dans les deux cas à la même époque, il n'aurait pas

> manqué à une époque quelconque d'atteindre le même degré. On s'étonnera de ce que dans le premier développement de *tch* soit sorti *ts* et non *ch* comme dans le second. [This [ts] is due to] une influence renouvelée de la voyelle palatale suivante,...qui ne s'exerce plus à l'égard de *tche* = *ce*, c'est-a-dire à une époque de beaucoup postérieure.[4]

Germanic loan words confirm this chronological hypothesis:

> Il existe une classe de mots dans lesquels [palatalizations before [i, e] and [a]] ont commencé en même temps et ont eu aussi par là le même resultat. Ce sont les mots germaniques. De *skina* est venu *échine*, comme de *skankjo*, *échanson*, et comme cet *échanson* concorde à son tour avec *échelle* = *scala*, nous pouvons sans doute admettre que *ća* = *ca* ne s'est produit qu'après les invasions germaniques mais pas beaucoup plus tard. Dans un dialecte français le *c* devant *a* ne s'est pas changé et le [reflex of CE, CI] se trouve à quelques degrés en arrière (*camp*, *cherf*). C'est le picard (*loc*. *cit*.).

André Haudricourt and Alphonse Juilland later develop similar views. Their essential contribution in this respect is the hypothesis of a functional—not merely a chronological—relationship between the two parallel channels discovered by Schuchardt (see below, 2.13, and Chapter Four).

Joret, Darmesteter

2.3 In 1874, Charles Joret publishes a study[5] whose conclusions are in agreement with those of Schuchardt and Ascoli. For Joret, three types of evidence support the assumption of a hushing stage:

A) Vulgar Latin texts (philological argument);

B) Similar palatalizations in Germanic languages (linguistic argument);

C) "Physiological" (= articulatory) constraints (phonetic argument).

Commenting on Joret's ideas, Arsène Darmesteter proposes a slightly modified phonetic channel, and poses some questions still largely unanswered today.[6] However, he expresses his basic agreement with the work under review and approves of the hushing channel.

Suchier and Varnhagen: The "Classic" Channel, and Those Who Reject It

2.4 The question is re-opened in 1878, when Hermann Suchier affirms that 12th century "CI, CE" graphemes in Picard and in Norman texts symbolize[7] hissing phonemes, as in Francien, and that the equally frequent graphemes "CHI, CHE" also represent [tsi, tse]. He thus agrees with the hissing channel posited by Diez. Suchier's views on the Francien and Norman-Picard palatal developments may be schematized as:[8]

Chart 1: The Classic Channel

tj				>	ts in Francien
kj	> c	>	ts		
ki, ke				>	tʃ in Norman-Picard
				>	tʃ in Francien
ka	>	k	> c		
				>	k in Norman-Picard

Later,[9] Suchier refines his conception of the palatalizing process leading to hisses; this new conception may be schematized with the channel [k > kj >] tj > tsj > t's' > ts.

In 1879, Hermann Varnhagen formally approves of Suchier's interpretation, and adopts his channel for Vulgar Latin;[10] this channel has since become classic. Thus in 1882 Johannes Vising described the process without discussing it: ki > k' > k'ç > t'ç > ts' > ts.[11]

Yet, in 1886, Eduard Koschwitz approves of Joret's hushing channel theory.[12] In their introductory chapter to the *Dictionnaire général*, Adolphe Hatzfeld and Darmesteter approved the choice made by Koschwitz. Their chronology is unusually late, but they clearly believe in the hushing channel: "CI, CE a passé à partir du 8^{e} siècle au son *tch* pour aboutir a *ts* au 12^{e} siècle et à *s* sourde au 13^{e}" (p. 138).

Lenz: The Third Channel

2.5 It was not until 1888 that a third possible channel of palatalization and affrication was proposed. In that year Rudolf Lenz publishes an articulatory and acoustic-auditory study of palatalization.[13] From both of these phonetic viewpoints, Lenz explains, the process most likely to take place is that in which hisses and hushes are not related to each other, but derive independently from a palatal occlusive. This third channel may be schematized as:

$$c \begin{matrix} > \text{ts} \\ > \text{tʃ} \end{matrix}$$

The articulatory argument consists in the fact that the tongue takes quite different positions to produce hisses and hushes; it appears simpler to conceive of the split as due to less noticeable divergences in the point of articulation at the previous, occlusive, stage. The acoustic-auditory argument consists in the fact that the acoustic differences between hisses and hushes are relatively great. This is auditorily confirmed by the observation that shifts from hiss to hush or from hush to hiss are extremely rare.

Gaston Paris approved these arguments, after having first chosen Joret's hypothesis, which he then considered "généralement admise." In 1904 he explicitly refers to Lenz when he remarks: "On pense aujourd'hui avec raison que, d'abord de cj ou tj fort, puis de c fort a pu sortir indépendamment aussi bien tš que ts; la question est à examiner séparément pour chaque domaine."[14] As for the Picard dialect, Paris does not agree with the explanation of Lenz, but with Suchier's hypothesis, namely, Picard [tʃ] must have been [tsj] at an earlier stage. Paris chooses the hissing channel for Picard for the reason that in that dialect intervocalic palatals developed into parasitic i's + hiss, like in French: LVÇERNA gives luiserne (not *lujerne), like in Old French. The hushes in cherf, canchon etc. must then be a later development. The theory advanced by Paris for the palatalization of t + j and k + j, i, e in Langue d'Oil may thus be schematized as:

> ts in Francien
c > tsj
> tʃ in Picard

The hush of Picard is due to the yod; there is no explanation for the disappearance (or the metathesis) of the yod in Francien: "... il est tombé purement et simplement dans le français général comme en provençal, tandis qu'en picard-normand il parait s'être combiné avec *ts* pour produire *tš*" (*ibid*., p. 332). Presumably, a similar *yod* was eliminated in Iberia and Northern Italy, while it combined with the hiss in Central Italy and Valachia. The channel for the intervocalic change -*tj*- or -*kj*- > -*jz*- is [c > tsj > dzj > jdzj > jdz > jz]. Concerning the metathesis of the *parasitic i*, Paris concludes: "Ce changement était déjà effectué quand le *tsj* a perdu son *j*..." (*loc. cit*.). This seems clear since if the preconsonantal [j] had not been disengaged from the postconsonantal one while this was still there, it could not have emerged. Elise Richter approved every step of this channel (see below, 2.11).

Passy

2.6 Paul Passy's *Etude sur les changements phonétiques* reverses the trend in favour of the hushing channel. Passy's phonetic experience support Ascoli's theory. He describes the articulatory constraints that render the hushing channel of palatalization probable. They depend on the rigidity of the middle of the tongue, which is the lingual point of articulation of palatals:

> Le milieu de la langue, qui sert à articuler les palatales, est large et peu mobile; lorsqu'à la détente d'une explosive on le sépare du palais, il est rare qu'on exécute ce mouvement assez vite pour empêcher le son transitoire d'être très distinct. Aussi ce son transitoire ... est perçu facilement comme un élément indépendant: (ce) fait à l'oreille inaccoutumée l'effet de (kçe), (tçe) ou (tʃe). Il n'est donc pas étonnant que les palatales, vocaliques ou soufflées, deviennent communément affriquées dans des langues qui conservent intactes les autres explosives. C'est ainsi que le (c) de l'islandais *kaeri* (cair*i*) 'cher' est devenu (cç)

> dans le suédois *käre* (cçɛ:rə). Ce (cç), une fois formé, tend toujours à se rapprocher de la position linguale, sans doute à cause de la plus grande souplesse de la pointe de la langue. En suédois méridional la combinaison devient (tsçɼ): on dit (tsçɛ:rə). Puis, le deuxième élément s'assimilant on a (tʃ), comme dans l'anglais *choose* (tʃu:z) "choisir," de *cēosan* dans l'italien *cera* (tʃe:ra) de *ceram*. Enfin, (tʃ) peut se changer en (ts), comme en suédois dalécarlien (p. 205).

Passy's normal palatalizing channel contains a necessary hushing stage, which is valid for Gallo-Romance as well. He continues:

> En français, le développement du *c* latin a été très varié. Devant *i* et *e*, il a dû donner d'abord (cç) et (tʃ); mais ce (tʃ), conservé en picard, est devenu (ts) de très bonne heure dans le dialecte de l'Ile-de-France: *centum* a donné *cent* (tsent) (*ibid*., p. 206).

Passy thus does not agree with Paris's position. He remarks:

> Ce n'est pas à moi de contester l'opinion de M.G. Paris, surtout en un point de philologie romane, mais j'avoue qu'elle me surprend. Il n'y a pas, sans doute, de raison à priori pour que (t^{s}ç) ne devienne pas directement (ts) aussi bien que (tʃ), et le passage de (ts) a (tʃ) n'aurait rien de surprenant. *Pourtant nous voyons partout le développement opposé* (ibid., p. 206, note 1; emphasis added).

It seems to Passy that the hissing channel is not impossible, but exceptional. He envisages the problem of Gallo-Romance palatalizations from a viewpoint which may be called functional. In the following lines, like Schuchardt before, and Haudricourt and Juilland after him, he suggests that the observable equilibrium in both the Norman-Picard and Francien reflexes may be due to a phonological relationship. He suggests that the [k] vs [tʃ] opposition of Old French, attested by Picard, was maintained but phonologically modified by a further transformation of its substance. As a chain, [tʃ] became [ts] and [k] became [tʃ]. This phonological development is supported by areal considerations since:

> ... comme le remarque M. Paris lui-même, il est singulier que la région où (ts) serait devenu (tʃ) soit la même que celle ou *c* devant *a* a persisté. On comprend bien que la présence d'un autre (tʃ) en français y ait empêché (ts) de devenir (tʃ); mais on ne comprend pas que toute la région qui a conservé *c* devant *a* ait changé (ts) en (tʃ) (*loc*. *cit*.).

The scheme of Passy's channels is thus (chart 2):

Chart 2: *The Hushing Channel* (examples)

tj
kj > c > cç > tʃ { > ts in Francien (*cerf*)
ki, e { > tʃ in Norman-Picard (*cherf*)

ka > k > k > k { > c > cç tʃ in Francien (*char*)
{ > k in Norman-Picard (*car*)

For Passy, palatalization was stronger in Francien than in Norman-Picard. This explains the deeper transformations that took place in the former dialect. But the functional difference remains unchanged, as /tʃ/ vs /ts/ is maintained in the same way as in the previous stage: /k/ vs /tʃ/, the stage still attested by Norman-Picard, which is a dialect phonologically more conservative than Francien. Thus, Passy concludes: "il semble naturel de penser que le français *avance* sur le picard pour le traitement de *c* latin, aussi bien devant *i*, *e* que devant *a*" (*loc*. *cit*.).

Horning, Nyrop

2.7 Adolf Horning begins by admitting the soundness of Joret's articulatory argument: "... vom Standpunkt der physiologischen

Theorie, so hat Joret gewiss recht."[15] But he then approves Diez, Suchier and Paris for philological reasons. Horning's uneasiness seems a clear symptom of the contradiction--which may be only apparent--between available phonetic and phonemic information on palatalization in general, and the documental evidence on the Gallo-Romance phenomena. In a later study, the channel that Horning seems to advocate is the "classic" *tj > tsj* one;[16] but at the same time he makes it clear (p. 211) that the Italian forms with an -*agione*/-*igione* ending (which are hushing) are popular phonetic forms dating back to the pre-Carolingian period, while *grazia*, *nazione*, etc. are to be considered semi-learned forms borrowed from Latin during the Carolingian period. Cristopher Nyrop is also hesitant, as in the following statement: "Voici comment s'explique le développement du group *tj*: l'explosive dentale subit d'abord une affrication et devient *ts* qui s'affaiblit en *dz*, puis *z*."[17] Elsewhere, however, he recognizes that it is not known whether [ts] or [tʃ] represent an older stage, once common to all Romance dialects, or if they both derive, independently and directly, from a palatal occlusive: "On ne sait si l'une de ces étapes [ts and tʃ] est sortie de l'autre, ou si elles sont indépendantes entre elles" (p. 399).

Dauzat, Bourciez, Grammont

2.8 Paul Marchot approves of the hypothesis of Lenz.[18] Ovid Densusianu supports Ascoli or Lenz, according to whether one interprets "altération définitive" between the [kj] and [tʃ/ts] stages as the palatal affricate [tʃ] or as the palatal occlusive [c]. Giorgio

Campus and Matteo Bartoli approve Ascoli. Alberta Dauzat bases his agreement with Ascoli on the observation of contemporary variations and evolutions in the Southern French dialects that he had studied in detail. In particular he inferred, from considerations of dialect geography, the probability of a necessary hushing stage in a palatalizing process.[19] Edouard Bourciez, and later his son Jean Bourciez,[20] on the contrary, support Diez and Suchier's "classic" theory. However, it is not quite clear whether they completely approve of Suchier's process, for a hypothesis similar to that of Lenz is also mentioned (*Précis*, p. 116). Iorgu Iordan, on the other hand, has no doubt that the hushes observable today are due to a relatively recent change that affect some of the original hissing reflexes of the Latin palatalized consonants: "... wo wir heute *ts* finden, ist das alte *ts* geblieben, während in den Wörtern mit *c* dieser Laut aus dem älteren *ts* sich entwickelt hat."[21] For Iordan, such a process as [tʃ > ts] is physiologically impossible, whereas, when pronounced with a certain force, [ts] is likely to develop into a hush. Maurice Grammont, "Notes de phonétique générale," reconstructs for Late Latin the palatalizing process (pp. 35-38):

$$t/j > t/tj > t/t^{s}j > t/ts > t/s > ts.$$

He proposes some examples in Italian, French and Spanish: *ragione*: "-zy- est devenu -z- par assimilation-fusion"; *raison*: "par *radzyon; en français tout *dz* s'est réduit à *z*, et les groupes terminés par un *yod* se sont mouillés au contact du *yod*, qui a rejailli devant;[22] *rason*: de *raδon" (p. 38). In *Phonétique du grec ancien*, he adds a new argument: the attested Latin spelling CRESCENTSIANVS in the 2nd century and the fact "que les grammairiens disent un peu plus tard que Titius se prononce Tits̲ius" (p. 99).

Meyer-Lübke, Millardet, Ronjat

2.9 Wilhelm Meyer-Lübke has always supported Lenz's theory. His Grammaire des langues romanes already contains an explicit approval of Lenz's reasoning.[23] His further studies in which the Vulgar Latin palatalizations are either discussed or simply mentioned reflect the same opinion. In his review of Ringenson's Etude...en français (see below, 2.17) he expresses his satisfaction at seeing his idea so clearly demonstrated, and so firmly established (p. 356). One of his important contributions as regards Lenz's theory is the fact that he discovers evidential arguments in its favour. He observes that Latin grammarians make a distinction between the sounds which are heard when articulating CI and TI: CI + vowel makes a "pinguis sonus," TI + vowel a "gracilis sonus."[24] There, he says, is the origin of the hushing and the hissing sounds, respectively, of modern Romance dialects. Georges Millardet, by his analyses using complementary methods and viewpoints, arrives at a different conclusion. Reasoning on the modern dialects of Gascony and their recent or contemporary evolutions, he induces a principle which turns out to be that of Ascoli, Schuchardt, Passy, etc.: the hushing channel hypothesis. He writes: "Le k̲ prépalatal, étant particulièrement sujet à se changer en c̲, ts̲, a dû subir cette évolution dans l'ensemble des idiomes romans."[25] Later in the same study, he suggests that the normal path of development for [dj] in

Late Latin is [j], [dʒ], and that consequently the four Italian forms *mezzo*, *mozzo*, *razzo* and *olezzo* must be semi-learned. It is with this point that Jules Ronjat disagrees, in his review. Ronjat believes on the contrary that a hiss is the regular, popular, phonetic reflex of Latin post-tonic TI + vowel in Italian: PVTEV gives [podzo] and it is only by analogy (with *poggetto*, **oggidi*, *raggiare*, etc.) that there are exceptions such as *poggio*, *oggi*, *raggio*, etc. This may be true, but it does not necessarily imply that these regular hissing forms did not go through the hushing stage, which their stressed counterparts seem to indicate.

Migliorini

2.10 In his article "L'intacco della velare," pp. 276-277, Migliorini finds an argument in favour of an early assibilation in the hypothesis that some Latin verses and Christian stock-sayings show intentional alliterations of the type:

CAELESTIS - SAECULARIS
CELER - SEGNIS
CAELUM - SOLUM, etc.

In spite of this, he clearly states elsewhere (pp. 274, 293) that the basic pronunciation of the palatalized consonants is that of the mediopalatal occlusive [c]: graphemes such as CE, CI are to be read as [ce, ci] sounds, Migliorini thus adopts a channel similar to that of Lenz; the split into hisses and hushes must have originated at the occlusive [c] stage (p. 290).

The "Classic" (Hissing) Channel

2.11 For many a Romance scholar, the standard book on Vulgar Latin pronunciation in Northern Gaul remains Richter's synthesis: *Chronologische Phonetik.*[26] Hers is the "classic" channel indicated by Diez and Suchier: *t + j* first, *k + j, i, e* later, follow the same path of development in the whole of Gaul (p. 84):

(k + j, i, e) > tj > tsj > ts;

then, "in ost-, nord- und südwestfranzösischen Mundarten wird *ts* [tʃ]" (*loc*. *cit*.). She submits the hypothetical phonetic process (*loc*. *cit*.):

(k + j, i, e) > cj > cçj > cçs > cs > ts.

When sonorization occurs, and a *parasitic i* is disengaged, the channel is thus (pp. 81-82):

(k + j, i, e) > tj > tsj > dzj > jdzj > j-dzj > j-dz.

Alfred Ewert briefly mentions a similar development for all French palatals. Their non-merging is not accounted for in terms of chronological differences, but of phonetic nuances: "The palatalization of $\underline{k}^a$ and $\underline{g}^a$ was less pronounced than that of $\underline{k}^i$, whence the difference in the development of [c] < k^i and [c] < k^a...."[27]

Mildred K. Pope, *From Latin to Modern French*, apparently bases her account of Gallo-Romance palatalization on Ringenson's study, to which she explicitly refers (p. 126), but which she might have partly misunderstood. Ringenson's demonstration, based itself on the "physiological" considerations of Lenz, purports essentially to show the improbability of a hush > hiss development, since it appears to her that a palatal > hush movement is on the contrary a likely development. Pope seems to use Ringenson's work to justify the impossibility of a hiss > hush process, i.e., Diez and Suchier's hissing channel. Pope herself posits a process which is a phonetically modified version of that of Lenz and Ringenson; that is, where no hush > hiss or hiss > hush movement takes place. The modification lies in the hypothesis that the common ancestor to both types of sound is not the palatal occlusive [c], but what she calls a "palatalized dental," symbolized as "t͡s." In all likelihood, this is something like a hishing affricate, a hish being the type of [ṣ] found in Modern Greek, Dutch and Spanish. A hish is a phonetic intermediary between a hush and a hiss, both from the articulatory and acoustic viewpoints (see below, note 31). Pope's interpretation of the channel of Lenz may thus be summarized as (ibid., pp. 123-135):

tj }
kj, i, e } > c > "t͡s" > ts
ka ———————————— > tʃ in Francien

It is not clear whether the hushing development is due, as it is in Ewert, to a phonetic nuance between fundamentally similar sounds, or to a different syntagmatic environment, i.e., followed by [a] (as in Eugene Dorfman; see below 3.33), or to chronological differences, as in Schuchardt and Passy. William D. Elcock, The Romance Languages, pp. 53, 363-364, simply states the various results without discussing the processes that led to them.

The Ascolian (Hushing) Channel

2.12 For Bertil Malmberg, it is the Ascolian (hushing) channel that is the correct one. Malmberg seems to believe that it has been proved for Gallo-Romance, or even that it is *observable*: "nous pouvons *constater* que cette évolution de *k* à *s* s'est produite par toute une série d'étapes (*k'*, *tj*, *tʃ*, *ts*, pour ne pas parler de toutes les nuances qu'il a pu y avoir entre ces stades)."[28] As a phonologist, Malmberg describes this process as one long-range phonetic move which has two articulatory implications: a shift forward in the point of articulation and a weakening in the mode of articulation:

> Il y a eu lieu un glissement de la langue de l'arrière à l'avant de la bouche, et en même temps, par un relâchement de l'articulation et par suite du même avancement de la langue, l'occlusion a été remplacée, d'abord en partie et ensuite entièrement, par une simple constriction (*loc*. *cit*.).

The fundamental novelty that Malmberg introduces in the account of these changes is the structural viewpoint. For him, *k* remained the phoneme /k/, even under the forms [cç], [tʃ] and [ts]: "... jusqu'au moment où la langue s'est créé de nouveau la possibilité d'articuler une occlusive vélaire devant une voyelle antérieure" when the sequence /kw/ became [k] and thus /k/ (*loc*. *cit*.). However, it may appear that Malmberg situates this development too late. It seems difficult to admit that the delabialization of Latin /kw/ did not take place until after the deaffrication of /ts/ in /s/, i.e., in the 13th century. It is thus difficult to accept his conclusion: "Par conséquent, le phonème *k* (réalisé comme *k*, *k'*, *tj*, etc. est remplacé d'un coup par le phonème *s*" (*loc*. *cit*.). This investigation suggests that there was a palatal phoneme opposed to both /k/ and /s/ at a much earlier time (see below, 4.31-4.34).

Haudricourt and Juilland

2.13 In *Essai pour une histoire structurale du phonétisme français*, Haudricourt and Juilland take the hushing channel theory for granted when they write that older palatalizations give hissing reflexes today and more recent ones hushing reflexes, since they posit that phonological *chains* must have played a role (pp. 92-93). The contemporary distribution may be schematized as (p. 90):

Chart 3a: *The Reflexes*

WESTERN ROMANCE		CENTRAL ROMANCE			EASTERN ROMANCE		
t + j	ts	t + j	>	ts	t + j		ts
k + j		k + j		tʃ	k + j		
k + i, e		k + i, e			k + i, e	>	tʃ

This distribution is the result of successive waves of palatalization. New palatals "pushed" anterior reflexes into the hissing area in order to avoid mergers of phonemes. These push chains may be schematized as (pp. 92-94):

Chart 3b: The Chains

	WESTERN ROMANCE	CENTRAL ROMANCE	EASTERN ROMANCE
1)	t + j > tʃ	t + j > tʃ	$\left.\begin{array}{l} t + j \\ k + j \end{array}\right\}$ tʃ

	WESTERN ROMANCE	CENTRAL ROMANCE	EASTERN ROMANCE
2)[29]	tʃ > /ts/	tʃ > /ts/	tʃ > /ts/
	$\left.\begin{array}{l} k + j \\ k + i, e \end{array}\right\}$ /tʃ/	$\left.\begin{array}{l} k + j \\ k + i, e \end{array}\right\}$ /tʃ/	k + i, e > /tʃ/

	WESTERN ROMANCE	CENTRAL ROMANCE	EASTERN ROMANCE
3)	/ts/	/ts/	/ts/
	/tʃ/ > /ts/	/tʃ/	/tʃ/
	k + a > /tʃ/	k + a > /k/	k + a > /k/

To complete the demonstration for Western and Central Romance, a fourth step may be specified:

	WESTERN ROMANCE	CENTRAL ROMANCE
4)	kw + i, e > /k/	kw + i, e > /k/
	kw + a > /k/	
	(in Francien)	

Michel

2.14 This integrated presentation did not easily find favour. In his penetrating Etude du son "s" en latin et en roman, Louis Michel, for example, occasionally verges on self-contradiction in his account of

French palatalization. Michel first describes the posited hissing channel: "La métastase du *T* devenue une spirante dentale passe a *S* qui se combinant avec le *Y* se mouille; puis comme le latin n'a pas d' *S* mouillé, *S'* se sèche" (p. 49). One may wonder how languages evolve phonologically if they cannot acquire sounds that they do not already possess. This hissing process is illustrated by the reconstruction: tj > tt-j > tθ-j > tsj > ts' > ts (*loc. cit.*). On the other hand, referring to Dauzat, Michel immediately affirms that, through a presumably similar [tj] stage, the velar followed the hushing channel: "K dégage alors un élément fricatif KY; l'articulation avançant encore, on aboutit a TY qui, lui-même, passe en TŠ puis à TS" (p. 50). On the same page, it is said that *k + i, e* "était déjà palatale en latin" and that its "palatalisation s'est accentuée à l'époque impériale" (p. 50), and that the palatalization of *k + j* "ne semble pas antérieure au IV^{e} siècle" because Ulfilas transcribes Latin FASCIA by *faskja*, "preuve que la gutturale latine était encore intacte."

Heinrich Lausberg seems to approve the hushing channel,[30] but at times he is ambiguous: "Lat. -tj- wird in der Gesamtromania palatalisiert und assibiliert" (p. 55). Does this mean that there was no intermediary stage between the (presumably occlusive) palatal and the sibilant, or simply that the whole process—which may have had several intermediary stages—was completed by the collapse of Mediterranean unity? Some processes are symbolized in such a way (p. 57) that it is again not clear whether there was a hushing stage or not. For example, what does the symbol "śś" mean[31] in the process: ssj > śś > jss > js? (*loc. cit.*).

Spence

2.15 In an article attempting to refute Dauzat's theory of superstratum as a cause of palatal regression [c > k] in Norman-Picard, Nicol Spence appears to favour the theory of Lenz, whom, however, he does not mention: "... [tʃ] and [ts] were probably both variant secondary developments of the same unstable primary group rather than *successive* stages through which *k + e* passed in Gallo-Romance as a whole...."[32] The nature of the "primary group" is not specified. Since Spence qualifies it as "unstable" it is probably [c], the palatal occlusive of Lenz, rather than Pope's *t͡s*. After Passy and Haudricourt and Juilland, Spence sees a functional explanation to the problem of the distribution of palatal reflexes in Francien and Norman-Picard. It seems to him that the Norman-Picard choice of /tʃ/ as the reflex of Latin *t + j* and *k + j, i, e* explains the fact that *k + a* remains /k/:

> If we take the development of [tʃ] as merely a variant regional development of *tj*, *kj* and *k + e/i*, and consider the further implications of this 'choice' for the further development of the system, we can see a possible reason for the further development of the system, we can see a possible reason for the retention of *k* before *a*. In the surrounding dialects, *k + a* was kept apart from *k + e/i* by differentiation to [tʃ]. If *k + e/i* had already differentiated to [ʃ] in Normanno-Picard this possibility was not open: *k + a* could either differentiate to [ts] or remain (or be restored to) *k* (p. 36).

One may wonder from what "*k + e/i* had already differentiated to [tʃ] in Norman-Picard." Besides, if it is true that [tʃ] and [ts] were variant secondary developments rather than successive stages of a channel, why did Norman-Picard *k + a* not differentiate to [ts] instead of remaining or being restored to [k]? This question seems especially relevant since the articulation from which /k/ *was* restored was presumably the same "unstable primary group"--probably [c]--as in the first palatalization. In effect, it seems that the improbability of the hissing channel is invoked implicitly here in order to reject the possibility of this differentiation in [ts]. But it would be premature to take up this matter here (see below, Chapter Four).

Delattre

2.16 In "La Théorie celtique et les substrats" (in Gallo-Romance phonological phenomena), Pierre Delattre discusses palatalization. He sees the hushing stage in the palatalizing process as essential. The Norman-Picard situation is accounted for by the hypothesis according to which palatalization in that area was not so deep or so strong as in the other parts of Gallo-Romania (in fact, of the Langue d'Oïl dialectal area), which had the result that k + a was kept as [k], while k + i, e did not develop beyond the hushing point: "[k] devant [e, i] n'avait atteint que la première étape de palatalisation: [kantu > tʃjãnt] au lieu de [tsjãnt]" (pp. 486-487). Delattre's reasons for choosing the hushing channel are of two types: phonetic deductions and experimentations, and linguistic observations. In an instrumental (acoustic) investigation of palatalization, he observes that a palatalizing process is not a process by means of which the mode of articulation of a consonant is changed, but by means of which its point of articulation is shifted to the mediopalatal area, where contact is established with the middle (or dorsum) of the tongue.[33] In "La Théorie celtique," Delattre supports this view with some observations on palatalization processes currently at work. Included are the hushing affrications following palatalization in English bid you, bet you, miss you, etc., as well as "la prononciation inévitable de [məʃø] pour monsieur" (p. 485; emphasis added; see below, note 39).

Ringenson

2.17 Ringenson's opinion on Gallo-Romance palatalizations typically reflects the contradictory theories evoked in the preceding pages. Her Etude sur la palatalisation de k devant une voyelle antérieure en français is first concerned, as the present study, with defining and describing palatalization as a phonetic process (pp. 1-112). The conclusions of this preliminary investigation are then applied to the Romance palatalization, in particular to the Gallo-Romance processes leading to the Francien reflexes (pp. 113-149). Ringenson first establishes the probability of the hushing channel, in general, and in French dialects. The palatalized dental occlusive is extremely "slippery" and ordinarily becomes a mediopalatal occlusive, and thus a hushing affricate very rapidly. Often, the palatal occlusive is heard as a hushing affricate (pp. 145-146).[34] This observation is related to the articulatory and acoustic constraints that explain it. A mediopalatal affrication results in a hush, which is, auditorily, easily distinguished. It is then retained as such, because the hush is a tenacious element that seems to be very well perceived by the ear (p. 146). She then immediately concludes that the hisses of French must have developed directly from the exceptional [tj] stage, i.e., through the hissing channel, since [c] can only result in a hushing affricate (pp. 146-147).

On the other hand, she merely mentions in passing that the [tj] stage is attested, sporadically. No attempt is made to use this evidence to support the theory of a hissing channel (p. 147 and p. 147, note 1). But the argument is weakened as she specifies the location of the few *patois* that show this [ti] stage,[35] and notes that it appears generally in the same *patois* that present direct assibilation of dentals before high front vowels. The observation that the hissing channel is attested supports the hypothesis of Lenz concerning the Romance palatalization but one does not see how the fact that it is exceptional, or linked with a different phenomenon (that did not take place in Gallo-Romance), could render it a probable channel for the Romance palatals.

2.18 Ringenson's demonstration to support Lenz's theory of palatalization in Gallo-Romance may be summarized as follows: since [tʃ > ts] as well as [ts > tʃ] are never observed in modern French dialects, the contemporary hisses and hushes must both derive from an older common ancestor. But then, there is a discrepancy with the rest of the observable data, as palatals usually affricate in hushes. In effect her study attempts to demonstrate that:

(1) the ordinary process is the hushing channel (*ibid.*, p. 112); this is predictable in the light of phonetic considerations;

(2) This ordinary evolution is observable almost everywhere, in particular in the vast majority of modern French dialects;

(3) [c] is often rendered as [tʃ] (cf. note 34);

(4) Yet the hissing channel attested only "çà et là" must be postulated for the Gallo-Romance palatalizations;

(5) Because [tʃ > ts] and [ts > tʃ] are phonetically impossible and never observed.

If it were shown that (5) is incorrect, Ringenson's argument would be shaky, and the Ascolian channel would appear probable. But before these five points are analyzed (see below, 2.25), it may be useful to summarize and briefly criticize the views just exposed.

THE CHANNELS

2.19 The following chart represents the varying positions held by the above-mentioned scholars.[36]

Chart 4: The Channels

c > ts > tʃ (Diez)		ts c > tʃ (Lenz)		c > tʃ > ts (Ascoli)	
Diez	1			Ascoli	1
				Schuchardt	2
				Joret	3
				Darmesteter	3
Suchier	4				
Varnhagen	4				
Vising	4				
				Koschwitz	4
		Lenz	5		
Paris	5	Paris	5		
				Passy	6
Horning	7			Horning	7
?Nyrop	7	?Nyrop	7	?Nyrop	7
Marchot	8				
		?Densusianu	8	?Densusianu	8
				Campus	8
				Bartoli	8
				Dauzat	8
Bourciez	8				
Iordan	8				
Grammont	8	Meyer-Lübke	9		
		Ringenson	9		
				Millardet	9
Ronjat	9				
		Migliorini	10		
Richter	11				
Ewert	11				
		Pope	11		
				Elcock	11
				Malmberg	12
				Haudricourt and Juilland	13
?Michel	14	?Michel	14	?Michel	14
				?Lausberg	14
		Spence	15		
				Delattre	16

Neither the text of this chapter, nor this chart which simply summarizes it, intend to give an exhaustive survey. The observations which arise from this survey are preliminary indications and not—even provisional—conclusions. Only after a critical appraisal of the arguments will a judgement be presented on the substance of the debate. It appears that linguists with essentially philological training tend to favour the views of Diez, whereas those whose first concern has been with phonetics and phonology seem to support the Ascolian process, except for Grammont. This opposition culminates with Ringenson who, as a dialectologist and as a phonetician,[37] accepts the hushing stage as eminently probable and yet, as a Romanist, finally decides on an exceptional process (the hissing channel) for the Gallo-Romance palatalizations. The choice of a channel depends on the criterion adopted.

The Evaluation Metric

2.20 Functional-structuralism has no explicitly defined, measurable and formalized criterion. Since, however, economy itself consists in the generalization of countless limited hypotheses concerning the pressures at work in language change (see, for example, Passy, _Étude sur les changements phonétiques_, pp. 225-227, and Martinet, _Economie_, pp. 33-34), it clearly contains a principle of choice. The purpose of this section is simply to render it explicit. The principle of economy defines the dynamic interplay of all the forces at work in linguistic evolution. It is based on the constant opposition between the necessity to make oneself understood, and the desire to reduce the cost of this process, i.e., the principle of least effort (see Martinet, Elements, pp. 13-14). The postulate consists in this: every linguistic change may be accounted for by a particular actualization of one of the two components of economy or their combination. An example might make this clearer. The Latin letter "B" has become "ℓ-"? A functional description of the change might read as follows: "B" is written by hand, and perceived by eyes. It is more economical for the hand to draw "B," in a cursive script, as "ℓ." Also because of muscular tendencies, the functional loop of the "B" and the muscular one of the "ℓ" (from "L") become difficult for the eye to distinguish. The need for a distinction prompts the development of a once non-functional feature: the second loop of the "ℓ." This curls up completely on itself before the ligature: "ℓ." This small loop, however, is itself subject to the muscular tendency to reduce it to a straight line, and again there is the danger of a merger with "ℓ," By hypercorrection, some people write a "b." The changes, here, are explained by a dynamic interplay of muscular tendencies and functional needs based on visual distinctions. The principle of economy is believed to apply in the same way in phonology. Here, however, the basic constraints are not the muscles of the hand and the power of distinction of the eye, but the muscles of the speech apparatus and the power of distinction of the ear. Hence /b/ and /l/ never run the risk of a merger as phonemes that they do as graphemes; the features are entirely different. But articulatory constraints tend to make /tj/ evolve into [c], [cš] (cf. above, Chapter one, note 6). If there is already a /cš/ in the system, the speakers may react in a way functionally similar to the writers, who changed the substance of the opposition "B" vs "L" to "ℓ~" vs "ℓ." Or, alternatively, a merger may occur. This is not unknown with letters either: some people write their "b" exactly like their "1." Only the other letters of the word (the context) carry the distinctions.

2.21 In phonology, the main parameters of economy are phonetic: articulatory and auditory. These parameters, like muscular and visual constraints with letters, are constant, invariable, but they always apply in a particular given system which also contains realities of its own; and these two elements cannot be entirely separated from their human, or social, "embedding." As a result of these postulates, the functional-structural evaluation metric is essentially this: does the hypothesis answer the problems in a satisfactory way from the viewpoint of economy, i.e., its phonetic and phonological components. The best solution is the one that appears the most economical from these two viewpoints. Martinet qualifies this criterion as that of vraisemblance phonologique or phonological likelihood. ("Phonologie et 'laryngales,'" p. 15). This phonological likelihood, since "la phonologie est une phonétique fonctionnelle et structurale" ("Substance phonique et traits distinctifs," p. 74) consists in phonetic likelihood, and functional-structural (or phonemic) likelihood. Phonetic parameters must thus be envisaged, and the hypothesis must appear economical, "likely," from the phonetic viewpoint. Between alternate solutions, the one that appears most satisfactory from the phonetic viewpoint must be retained. This demand had implicitly been accepted in traditional linguistics (see, for example, Darmesteter, "Review of Ch. Joret, Du C," p. 392, Dauzat, "Notes," pp. 26-32, van Ginneken," La Biologie," p. 306, Meillet, "Review of G. Campus,'Le velari latine,'" p. 222, etc.). This is why Migliorini, at the beginning of his study "L'intacco della velare," requires a thorough phonetic investigation of palatalization and affrication: "une trattazione complessiva del problema delle velari esigerebbe che fossero preliminarmente esaminate le premesse fisiologiche dell'intacco per valersene naturalmente nei limiti in cui tali ricerche hanno valore" (p. 273). This opinion has also been adopted, in various ways, by scholars who have been seduced by the generative approach, for the reason, as Corbett puts it, that "it is in all likelihood, indisputable that much change derives from assimilation within the phonetic continuum" ("Review Article" p. 275). Also see, Wallace L. Chafe, "Review of P.M. Postal, Aspects," p. 124.

2.22 Phonetic likelihood may be perceived as a rather vague, or at least "rubbery," notion, that would allow the investigator to suggest whatever phonetic path he likes and still to be able to justify his whim by an appeal to phonetic norm. Certain misunderstandings have arisen on this question, due to the fact that certain scholars may have overworked the notion, e.g. Grammont, Fouché and, possibly, Dauzat and Straka. Apart from the—essential—observation that languages evolve in a way that obviously betray the fact that they are spoken and heard, and not, say, drawn and seen or touched and felt (cf. above, 2.20), two ideas may be stressed, that point to the legitimacy of taking phonetic "regularity" into account. First, as has often been recognized, and as Hockett explains: "to call something habitual is probably to some extent explanatory" (The State, p. 64). Thus, if one can support a phonetic claim with the observation that what is first predicted as phonetically likely (hence "normal") is also, practically, frequent and regular, one may suggest that a particular event that conforms to the prediction is partly explained thereby. Corollarily, if a particular event is not known, the claim that it is likely to have conformed to the prediction is partly valid; no certainty, however, can be attained in this way, although, of course a high probability may at times guarantee the value of a choice made according to this method. Such perhaps is the case with the hushing channel, whose supporting evidence is outlined below (2.25-2.27). The second point that must be emphasized in relation with the hypothesis of phonetic constraints is that it does not, usually, make predictions of the type: "A normally becomes B," but of the type: "if A becomes C, the normal way to do so is through B." If we have the sequence FATA in Latin, phonetics does not predict that it might become [fe] in French (it may become hundreds of other things--and does so in innumerable other Romance dialects and languages). But it asserts that, given ['fata] and [fe], a channel such as ['fata › 'fa:da ››'faæda › 'fæɛda › fɛeðə› fe:ə › fe: › fe] is more likely to take place than, say, ['fata › fu'tɛz › fe]. Each step is not seen as necessary, given a certain stage, but as probable as the shortest way between two stages that are known.

2.23 In close connection with this method, thus, philological evidence must guarantee the actual existence of the limits within which one works, and, at least, present no contradiction with the hypothesis (see below, 2.28). Gathering philological data must not be, however, the only task of the linguist or of the phonologist. Written texts seldom indicate phonemic changes unambiguously, and virtually never do they indicate phonetic changes. The evidence must be interpreted (see below, 3.13) in the light of phonetic and phonemic realities. As Martinet suggests, functional-structuralism is "une méthode qui, bien entendu, ne peut porter tous ses fruits que _combinée_ avec les recherches philologiques de type traditionel" ("R, du latin au français d'aujourd'hui," p. 194; emphasis added).

2.24 Finally, the second component of phonological likelihood requires that the hypothesis be compatible with the phonemic system as a whole. This implies, first, that there be no contradiction (a phonemic merger later restored without explanation, for example) between a channel of development and the nature of the units of the system. It also implies that between two or more acceptable hypotheses, that one must be retained that consists in the fewest changes, and the most predictable ones in terms of the phonemic structure. This criterion of phonological simplicity, with or without the measuring apparatus presented by some generative scholars (e.g. Chomsky and Halle, _The Sound Pattern of English_, Chapter 9), has also been recognized for a long time in linguistic studies. One may conjecture that Passy's "base articulatoire" (_Etude sur les changements phonétiques_, pp. 244-245) or Grammont's "faits de même nature" ("Review of F. Brunot, _Histoire de la langue française_, I," pp. 96-98) are in effect attempts at defining _idiolinguistic_ phonic constraints. This criterion, systematically used by functionalists, is in fact often used by their opponents as well: see, for example, Corbett's discussion of Martinet's treatment of the Western Romance lenitions ("Review article," pp. 276-277) or his appreciation of L. Romeo's hypothesis concerning some doubtful Romance diphthongizations (*ibid.*, p. 286). He concludes: "it seems prudent to support the hypothesis which explains the attested facts in the simplest way" (*loc. cit.*). The criterion of *phonological likelihood* makes it possible to evaluate the hypothesis presented above, and to derive a procedure of investigation for this study itself.

THE CRITICAL APPRAISAL OF THE ARGUMENTS

2.25 As Passy explains, there is no reason why any of the three channels should be rejected as absolutely impossible (cf. 2.6); there is no reason *a priori* why the palatal occlusive should not develop into a hiss (*Etude sur les changements phonétiques*, p. 206, note 1). There is no universal compulsion, for a palatalized cluster in any language at any time to take one of the three channels. For the Vulgar Latin and Gallo-Romance changes in the palatal area, even a development as phonetically unlikely as the one postulated by Diez must be accepted if it is supported by decisive arguments of another nature, philological for instance. In effect, the observation that today most Romance dialects, and in particular most French dialects have hissing reflexes of palatalized clusters which affricated during or soon after Imperial age, supports the "classic" theory of Diez. Yet, this argument is not decisive. The fact that results are similar does not imply that there were no intermediary steps, either common or parallel, in the developing languages. For example, English and German had a similar "vowel shift" which, for both languages, finally transformed [u:] and [i:] into [aw] and [aj] respectively: [hu:s] and [wi:n] are [haws] and [wajn] today. Dutch alone attests (for old [i:] only) the intermediary stage which is known, from other sources, to have taken place independently in the three languages. In Gallo-Romance palatalizations, the hushes of Norman-Picard may be interpreted in the same way: as the remnants of a development which was to end up with hisses in almost all other areas of Gaul. This reasoning holds true for the pattern of Diez too, but since, as is suggested by most phoneticians, it is the hushing channel that is normal,[38] "ordinaire" (Ringenson),[39] it is those who agree with the theory of Diez who should advance supporting evidence of a non-phonetic nature to justify the choice of a phonetically improbable channel. Unless there is an argument that contradicts it, the functional-structural evaluation metric demands that the hushing channel be considered more economical, since it turns out to be phonetically more natural than the hissing one.

2.26 It may be argued, to support the theories of Diez or of Lenz, that these solutions are *simpler*--both in the general English and in the generative sense. On the one hand it may appear "simpler" to go directly from [c] to [ts], jumping over the *[tʃ] step. And on the other hand it is *simpler* to have the final results directly derived from a deep structure containing all the relevant information: the various environments. For French, a rule will transform *t/k + j* and k + i, e into hisses; and k + a into hushes. Similarly ad hoc rules can be devised for Norman-Picard, Walloon, etc. Chomsky and Halle's marking conventions put an end to such meaningless practices, so close, in effect, to the Neo-Grammarians' "metachronic equations" which did not describe, let alone explain, the changes. On the contrary, one of Chomsky and Halle's conventions renders the grammar simpler if one supposes a hushing stage in the course of a palatal development.[40] Besides, it seems "more economical," and "simpler" to reconstruct a mediopalatal (presumably more or less affricated and thus hushing) stage to account for the presence of parasitic i's.[41]

2.27 The argument of Lenz, supported by Ringenson's remark to the effect that we can observe the "tenacity" of the hushing element (Etude ... en français, p. 147) is often invoked (see, for example, Migliorini, "L'intacco della velare," p. 273). But it is one thing for a sound to maintain its form over the period of a dialectal study--two, ten or twenty years?--and another to stay unchanged over generations and centuries. In reality there are reliably attested sound changes involving a hush > hiss or a hiss > hush move.[42] As a result, the hissing nature of the final reflex does not imply that there was no intermediary hushing stage.

2.28 The strongest type of evidence, in such a matter, remains the philological: the documents of the time when the change took place, provided that they are correctly interpreted. Written forms such as the above mentioned CRESCENTSIANVS, or TERCIVS, COMMERTIVM, INDITIA, PRONVNCIARE, ECIAM, POSIVS, etc.,[43] prove little by themselves. They show that the [tj - kj] merger has taken place, since the T and C letters are now used interchangeably before I followed by a vowel; but it would be premature to infer that their sound is hissing simply because most Romance languages today use "ts" and "c" before "i" and "e" to symbolize hisses.[44] Letters are not phonetic, but phonological symbols. If no hush vs hiss distinctive opposition existed in Latin at the time, why would it have appeared necessary to distinguish the two sounds in the spelling? Besides, even if, for one reason or another, some copyists felt the need to distinguish between hushes and hisses, what letters in the Latin alphabet would be suitable for this new purpose? The Classical Greek alphabet had no letter that was used to symbolize a hushing phoneme either; even today, when English *joy*, *jamboree*, or French *chauffeur*, *bourgeois*, are transcribed in Greek garb, they appear as τζόϋ, τζάμπορη, σωφέρ (or σοφέρ), μπουρζουά. It would be mistaken to conclude that in the 20th century, *joy*, *jamboree* and *chauffeur*, *bourgeois*, were pronounced [dẓoj], ['dẓaburi] (sic) and [ṣo'fɛr], [bur'ẓua] in English and in French. Thus the sixth century form Λόυτζολο[45] (for *LVCIOLVM) cannot be taken as conclusive evidence that the palatal cluster was hissing at that time (see below, 3.12-3.19). In effect, investigation of the philological evidence does not seem to give conclusive support to the existence of the hissing channel; it seems to suggest, on the contrary, that the phonetic value of the friction that followed palatalization was somewhat different from that of the Latin (or Greek) /s/.

NOTES TO CHAPTER TWO

[1] Bruno Migliorini, in his "L'intacco della velare nelle parlate romanze," describes this question as the "problema più interessante e più dibattuto, se in casi di *z* (ţ) da *k* inplinchino oppure escludano una fase intermedia *č* (cioè se il francese, il macedoromeno, ecc., abbiano avuto una fase palatale prima di giungere alla fase sibilante, oppure siano giunti direttamente a questa)..." (p. 273).

[2] *Grammaire des langues romanes*, p. 232. The *ć* here represents [tʃ].

[3] "Saggi ladini, I," p. 81.

[4] "Phonétique française: *ch*," p. 284.

[5] *Du C dans les langues romanes*, p. 78.

[6] "Review of C. Joret, *Du C dans les langues romanes*." Darmesteter introduces a [tj] stage immediately before hushing affrication; he also corrects Joret's relative chronology of palatalization. Darmesteter's questions to Joret are concerned with such irregularities as the reflexes *place* < **platea* instead of **plaise* and *plaise* < *placeat* vs *fasse* < *faciat* (p. 387).

[7] For philological questions, see below, Chapter Three.

[8] "Die Mundart des Leodegarsliedes," pp. 295-296.

[9] *Forschungen zur romanischen Philologie*, *passim*.

[10] "Das altnormannische *C*," p. 174.

[11] "Ueber französisches *ie* fur lateinisches *á*," p. 372, note 1.

[12] _Commentar zu den ältesten französischen Sprachdenkmälern_, p. 69.

[13] "Zur Physiologie und Geschichte der Palatalen."

[14] "Le Mode et les étapes de l'altération du C en gallo-roman," p. 324. For his previous opinion, see "Review of G. Lücking, _Die ältesten französischen Mundarten_," p. 137.

[15] _Das lateinischen C vor E und I_, quoted by Karin Ringenson, _Etude sur la palatalisation de k devant une voyelle antérieure en français_, p. 197.

[16] "Zur _Ti̯_ -Frage im Französischen," p. 215.

[17] _Grammaire historique de la langue française_ I, 447.

[18] P. Marchot, _Petite phonétique du français prélitteraire, Seconde partie: les consonnes_, pp. 52-57; O. Densusianu, "Review of P. Mayer, Die Aussprache des c," p. 100; G. Campus, "Le velari latine con speciale riguardo alle testimonianze dei grammatici"; M. Bartoli, "Per la storia del latino volgare."

[19] _Tableau de la langue française_, pp. 108-109.

[20] E. Bourciez, _Eléments de linguistique romane_, p. 171; also see Bourciez, _Précis historique de phonétique française_, pp. 116-146.

[21] "Lateinisches ci̯ und ti̯ im Süditalienischen," pp. 679-680.

[22] In _Phonétique du grec ancien_, one reads: "*_ratsyone_ > *_radzyone_ > _raidzon_ > _raison_" (p. 102).

[23] Vol. I: _Phonétique_, p. 403.

[24] *Einführung in das Studium der romanischen Sprachwissenschaft*, p. 154.

[25] "Linguistique et dialectologie romanes: 2ème partie. Le Problème phonétique," p. 261.

[26] *Beiträge zur Geschichte der Romanismen: Chronologische Phonetik des Französischen bis zum Ende des 8. Jahrhunderts*.

[27] *The French Language*, p. 71-72.

[28] *Système et méthode. Trois études de linguistique générale*, p. 39; emphasis added.

[29] It is conjectured that Western Romance has a development similar--if not common with--Central Romance because of the difference of treatment still attested in intervocalic position: RATIONE > *raison* vs FACIA > *face*. This argument, however, may be weakened by the observation that the change VICINV > *voisin* is parallel to *raison*, not to *face*.

[30] See *Romanische Sprachwissenschaft: II, Konsonantismus*, pp. 9-10, 14, 49.

[31] If the answer given is "a geminated palatal (or palatalized) *s*," then what do *palatal* or *palatalized* here mean? If it means *followed by a yod-like transition*, it is the same as *ssj*; *preceded and followed by yod-like transitions*, it equals *jssj*; and *if the consonant itself is palatal*, it cannot be *s*--which is alveolar or dental--and thus has to be either a mediopalatal (hushing) fricative: [ç], [ś] or [ʃ] or the prepalatal hish: [s]. Cf. 2.10.

[32] See Dauzat, "Le Substrat germanique dans l'évolution phonétique du français," N.C.W. Spence, "The Palatalization of K, G + A in Gallo-Romance," pp. 35-36.

[33] "From Acoustic Cues to Distinctive Features," p. 203.

[34] A note here says: "Observer aussi que la plupart des travaux traitant des patois donnent la graphie te [= [tʃ]]" p. 145, note 1.

[35] A note here says: "Au point 801, le patois de St-Eloi-les-mines. Cf. plus haut, p. 103." Page 103 describes the "palatalization process" at work in this village. Here, a confusion is not entirely avoided; direct assibilation of dentals before high vowels interferes with real palatalization. The two processes must then be considered with special care (see 1.2-1.11 and note 42 of this chapter).

[36] The chart lists the names in the same order as they appear in the text of this chapter, which is roughly the chronological order. The number to the right of a name refers to the paragraph where it first appears; a question mark to the left of some names indicates uncertainty.

[37] She was a student of P.J. Rousselot's.

[38] Cf. above, Passy (2.6), Malmberg (2.12) and Delattre (2.16). Marguerite Durand, "La Palatalisation des consonnes. L'exemple de l'anglais," arrives at the same conclusion. It seems to her that, in an experimental analysis, phoneticians must start with this principle. When the point of articulation of a consonant is palatalized, i.e., becomes articulated by the middle of the tongue on the middle of the palate, the shape of this part of the mouth determines affrication:

"la conformation de cette partie de la bouche entraîne cette conséquence: le détachement des deux organes en contact, l'explosion de la consonne, est nécessairement lent." This affrication is hushing: "lorsque ce temps de détachement est suffisant nous le percevons en la partie finale de tʃ et dʒ" (p. 182).

[39] The hushing channel seems much more frequent in the development of palatal occlusives than the hissing channel. A brief survey, based on the statistical principle of random selection, seems to indicate that the vast majority of palatalizations observable take the hushing channel. In non-Indo-European languages, the hushing channel has been reported for Arabic (Martinet, "La Palatalisation 'spontanée' de G en arabe"), Hungarian (Ludwig Hegedüs, "Neuere Untersuchungen über die ungarischen Affrikaten," p. 174), Tagalog (K.W. Berger, "An Introduction to Pilipino Phonetics and Pronunciation," p. 27), Mandarin Chinese (Robert L. Cheng, "Mandarin Phonological Structure"), Fox (Charles F. Hockett, A Manual of Phonology, p. 92), Nupe (Larry M. Hyman, "How Concrete Is Phonology?" p. 65), Burmese (Raven I. McDavid, "Burmese Phonemics," p. 17), and in the Barua dialect of New-Guinea (J. Lloyd and A. Healey, "Barua Phonemes: A Problem in Interpretation," p. 35). In Indo-European languages, the hushing channel has been reported in Modern Greek (André Mirambel, "Du Caractère des chuintantes dans certains parlers néo-helléniques," pp. 67-72), Swedish (Kim G. Nilsson "The Development of Sibilants in Swedish," pp. 179-180), English (Old and Modern English; see Durand, "La Palatalisation des consonnes," and "La Palatalisation en anglais") and Dutch (Norbert Morciniek,

"Fremdphoneme in der niederländischen Hochsprache," p. 213). In Romance languages, the hushing channel is massively attested by the žeismo of most South American Spanish dialects, and by the tendency, observable in many Italian dialects, to affricate in hushes the /kj/ and /gj/ sequences of chiesa, Alighieri, etc. Finally, hushing affrication of palatalized dentals and velars is observed in most French dialects of France and Wallonia (see Ringenson, first part, pp. 1-112), of North America (see Hosea Phillips, "Etude du parler de la paroisse Evangéline") and in the Creole dialects of the Caribbean, of Mauritius and Réunion (personal observation). For examples of the hissing channel, see below, note 42.

[40] Noam Chomsky and Morris Halle, The Sound Pattern of English, formulate a rule to express the naturalness of the hushing affrication of palatalized consonants, in spite of some complications that this rule creates when applied to the Slavic data chosen as an example (pp. 420-430). The hushing channel of development has been considered natural by Ginneken (cf. above, Chapter One, note 6), Ascoli, Dauzat, Passy, Sapir, Malmberg, Delattre, Durand, and many others; it is noteworthy that even when the hushing channel causes difficulties in a particular problem, it is often accepted by the investigator as being the normally expected one (cf. above, Horning, 2.7, and Ringenson, 2.17). Sona-graphs, segmentators and speech synthesis machines have confirmed these converging observations and synaesthetic intuitions. A palatalized occlusive is an occlusive whose release shows yod-transitions and/or mid frequency turbulences (see Delattre "From

Acoustic Cues to Distinctive Features," pp. 203, 220). Mid frequency turbulences are hushing sounds (p. 220). These observations and experiments render the hushing channel the "expectable" one, and justify Sapir's conclusion: "Certain typical mechanical tendencies there are (e.g., *nb* > *mb* or *-az* > *-as* or *tya* > *tša*)..." (*Selected Writings*, p. 44).

[41] This argument had been forseen by Ascoli (cf. above, 2.1). The *parasitic i* is the *i* in *voisin*, *raison*, *vaisseau*, *cuisse*, etc., from VICINV, RATIONE, VASCELLV, COXA. It seems to have been "disengaged" from the palatalized cluster, where its presence was a phonetic *parasite*. In effect, an often suggested way of "disengagement" is a metathesis: RATIONE, for example, would have evolved as [ra'tsjone], then the *yod* would have jumped over the consonantal cluster: [raj'tsone] (cf. above Marchot, Grammont, 2.8, and Richter, 2.11). This solution, however, may appear unsatisfactory to the extent that 1) a metathesis is a relatively rare, and seldom a regular phenomenon in linguistic development, 2) a metathesis does not account for the *parasitic i* of *voisin* < VICINV, or *raisin* < RACEMV. This criticism is all the more founded since *raisin* and *raison* (< RATIONE), for example, appear to have been treated in a similar manner. A single solution to account for both types of etyma may thus appear more economical. In effect, phonetics reveals that there are *yod*-transitions before and after palatalized consonants. *Yod*-transitions are maximally clear before a completely palatalized, i.e., a (dorso-) mediopalatal consonant or cluster (see Delattre, "From Acoustic Cues,"

pp. 203, 220). The acoustic and auditory origin of *parasitic i* seems to be there. If a complete process of palatalization takes place in Vulgar Latin--something which seems to be indicated by the early merger [tj - kj] (see below, 3.2)--the palatalized consonants of RATIONE and RACEMV merge as palatals. As such they have clear *yod*-transitions, and tend to affricate. The "disengagement" of the *parasitic i* is thus merely the phonemic emergence of a phonetic feature present in the palatal consonant or cluster itself.

The observation that voiceless occlusives and affricates have a particularly abrupt onset among consonants may further explain the distribution of *parasitic i* in French. The absence of such *i*'s before consonants and clusters which were voiceless when palatalization occurred in Gallo-Romance may be accounted for, from a phonetic viewpoint, by the fact that *yod*-transitions are less perceptible before such groups. This is due to their abruptly silent onset. While *MATTEA, FACIA, FACTIONE, etc. give *masse*, *face*, *façon*, voiced or fricative-starting palatalized consonants and clusters in Gallo-Romance disengage a *parasitic i* in intervocalic position: VICINV, RATIONE, PISCIONE, *BASIARE, MESSIONE, PALATIV, etc. give *voisin*, *raison*, *poisson*, *baiser*, *moisson*, *palais*. This explanation involves a relative chronology whereby sonorization precedes affrication and disengagement of *parasitic i*, and is thus examined below, in 3.37 and 4.1-4.10.

[42] Ringenson's argument seems weak if, as suggested in 2.18, it appears that hush > hiss (or hiss > hush) developments are more frequent than the hissing channel. In the course of the random survey evoked above

(note 39), some instances of the hissing channel were indeed attested. These attestations, however, are more often reconstructed than actually observed; most of them show a definite interference of the other process (described in Chapter One), direct assibilation of dentals. Here are the examples. In Selepet, K.A. McElhanon, "Stops and Fricatives: Non-Unique Solution In Selepet," reports that the phoneme /z/ has the allophone [i] in word initial position before central and back vowels, and in intervocalic position, and the allophone [zj] in word initial position before front vowels (p. 50). The contemporary Russian palatalized (dental) consonants and clusters (as in [govoritj] 'to speak,' for example) seem more hissing than hushing. But Russian also undergoes direct assibilation of dentals before [i]. The Romantsch patois of Bergün has hissing affricates that seem recent and derived from palatalized consonants without passing through a hushing stage, as there are hushing affricates kept in the system, in the same environment (see C.M. Lutta, "Der Dialekt von Bergün," p. 168). Three French patois show the hissing channel. Rousselot discovered it in the village of Montbron (Charente). The discovery was confirmed by Ringenson a few years afterwards (see Etude ... en français, p. 102). She herself discovered it in two patois of Bourbonnais: that of St-Bonnet, and that of St-Eloi-les-Mines. In this second patois, however, dentals assibilate before high front vowels (p. 103). Dauzat, "Géographie phonétique," indicates the hissing channel of palatalization as a local characteristic of Basse-Auvergne, but his descriptions indicate that the dentals assibilate before high front vowels. In general, he believes in the hushing channel, which he has observed much more frequently (see pp. 17, 122 *et passim*).

Hush > hiss and hiss > hush changes, however, are widespread. There are such changes attested in Modern Greek (Mirambel, "Du Caractère," p. 71), in German (s + consonant > ʃ + consonant), in Dutch (/s/ is [ṣ] = [s] = [ʃ]), in Portuguese (in syllable final position [s] > [ʃ]), in Spanish (/s/ is [s] in most South American dialects, whereas it is [ṣ], at times tending towards [ʃ], in Spain; see Tomás Navarro Tomás, *Manual de pronunciación española*, p. 96). More specifically, [tʃ] > [ts] changes--which, according to Lenz and Ringenson, are impossible--have been reported in large *Romance* areas. In the Spanish of South America /tʃ/ has often a more or less hishing actualization. Rudolf Lenz, Andrés Bello and Rodolfo Oroz, *El español en Chile*, report that in Santiago /tʃ/ oscillates between [tʃ], [c], [t'ṣ] and [ts] (p. 150). The same hesitation is observed in Madrid, and Toledo by Ramón Menéndez Pidal. (See *Manual de gramática histórica española*, p. 108: "hay vacilación entre t͜ š fuertamente mojada y una articulación mas adelante, próxima a *ts* poco mojada. La *ch* popular madrileña y toledana tiende a este último grado.") Popular Italian also frequently renders /tʃ, dʒ/ by hishing or hissing affricates (see Amerindo Camilli, *Pronuncia e grafia dell'italiano*, p. 24). According to Dauzat, "Notes," p. 28, it is natural for /tʃ, dʒ/ to evolve towards [ts, dz], whereas /ʃ, ʒ/ usually retain their point of articulation.

[43] For philological arguments, see Chapter Three.

[44] See William S.-Y. Wang, "The Chinese Language," p. 60: "... there is no direct way to determine how a letter was pronounced. With alphabetic languages the phonetic values must ... be arrived at by inference." For such a discussion, see below, 3.13.

[45] Procopius's "papiri ravennati" (Ravenna, 6th century) contain such forms as Λοὔτζολο for LVCIOLVM and Μουτζιάνι Καστελλον for MVCIANI CASTELLVM (see Migliorini, "L'intacco," p. 287).

CHAPTER THREE: THE PHILOLOGICAL EVIDENCE

LATIN GRAMMARIANS

3.1 The first philological evidence to be consulted is the description and comments made by Latin grammarians on the pronunciation of their language. The Latin grammars that are known today were published in critical editions by Heinrich Keil.[1] The collected readings are free of orthographic mistakes since Keil corrected the manuscripts. He explains the different types of mistakes he has encountered. Some of them, either committed by the grammarian himself, his scribe (?) or a later copyist, are relevant to this study.[2]

Palatalization

3.2 Keil notes that one of the most frequent "mistakes" is the permutation of CI and TI before a vowel. There are innumerable examples in all manuscripts of all periods:[3] *amititia*, *pertinatia*, *audatior*, *provintia*, *fartio*, *vintio*, *adfitior*, *aspitio*, *conitio*, *discrutior*, *commertium*, *offitium*, *inditia*, *speties*, *sotius*, *nestio* vs *cercior*, *forcior*, *tercius*, *saciatus*, *gracia*, *recia*, *vicia*, *licencia*, *proporcio*, *spacium*, *quociens*, *pronunciare*, *eciam*, *pocius*, etc. (*ibid*., xlii).

This seems to indicate that the merger of dentals and velars before a palatal has been completed.[4] Apart from the first example AMITITIA for AMICITIA, the merger takes place only before I in hiatus; this was probably a *yod* (see below, 4.5). AMITITIA itself may be a spelling mistake due to the repetition of the (written) syllable TI, but it may also indicate that palatalization before high front vowels has taken place.[5]

Delabialization and Other Phenomena

3.3 The replacement of QV by C and vice-versa is also frequent: sequutus, eloquutio, quur; secuntur, oblicos, propinco, etc. (ibid., p. xliii). It seems to indicate delabialization of /kw/ before /o, u/.

Loss of /n/ Before /s/; Hypercorrection

The nasal consonant in implosive position is weak, and it seems to have dropped before [s]. A sequence containing -NS + vowel in Old Latin thus has now an intervocalic [s].

Sonorization; Or Orthographic Archaisms?

Such forms as Puplius, puplicus, pleps, apruptum, agutus, aguitur, laguna, grateras, agris for acris and arcutus, uncunt may indicate some sonorization of consonants in intervocalic position, but the attestations are unreliable as these letters seem to be used for their etymological rather than for their phonological value (see below, 3.13, et passim). It may be conjectured, however, that there is some phonological uncertainty, since not only C and G are confused --which is an orthographic problem--but also T and D and P and B. An AMBOS for AVOS indicates that intervocalic /b/ and /v/ have merged. The functionally related processes of sonorization and lenition may thus be conjectured to have started.

The Alphabet

3.4 The volume published by Hagen, Keil, VIII, contains fragments of grammars written by auctores anonymi; one fragment, Orthographia Bernensis I, de litteris c, pp. 307-308, is a brief articulatory description of the Latin alphabet. C is described as: "molaribus super linguae extrema appulsis exprimitur"; "G spiritum cum palato"; "K faucibus palato formatur"; "Q appulsu palati ore stricto"; "S sibilum facit dentibus verberantibus"; "X quicquid c atque s formavit, exsibilat"; "Y appressis ... spirituque procedit"; "Z vero Appius Claudius detestatur, quod dentes mortui, dum exprimitur, imitatur."[6] This compendium was probably written for the students to memorize, whence its mnemotechnical character. As a description it tells little; sounds and letters are equated with each other, including "i" and "u" in vocalic and non-vocalic positions. Nothing certain can be inferred as to the pronunciation of palatalized sounds. It thus appears necessary to examine the extant Latin grammars and to analyse each item susceptible to palatalization.

Semi-Vowels

3.5 According to both the scansion of classical Latin verses and the statements of grammarians, "i" and "u" in non-vocalic (hiatus) position were semi-vowels in normal speech. In poetry, dieresis and syneresis are possible:[7] Beda attests the possibility of dieresis: "... aut ab i loco consonantis posta, ut Troia, quae positio non numquam in metris in tres dividitur syllabas, ut est illud,

> arma virum tabulaeque et Troia gaza per undas."[8]

But some of the verses that he later takes as examples of other metric phenomena reflect the syneresis of the normal pronunciation:

> "custodes suffere valent, labat ariete crebro"
>
> "parietibus novitas latet intus operta vetustas."[9]

The fact that E is also actualized ordinarily as [j] in that position is frequently attested by the substitution of "i" for "e." The author makes a remark concerning the spelling of the word DOLEVM: "Dolium per i scribendum, non doleum per e" (p. 270). Caper similarly requires: "Sobrius per i, non per e scribendum."[10] The /i/ and /u/ phonemes in hiatus position have acquired a phonetically consonantal value. Diomedes observes: "ex his igitur vocalibus i et u transeunt in consonantium potestatem, cum aut ipsae inter se geminantur, ut Iuno vita, aut quando aliis vocalibus adplicantur, ut vates velox vox Iamus iecor."[11] This phonetic observation is supported by Terentius Scaurus's phonotactic reasoning; on the one hand there is

ex Irpinis non e
ex Vmbria non e

but on the other hand:

e Vaticano
e Iudaca

Scaurus thus reasons that in hiatus position, vowels have acquired a consonantal value: "sin proximas litteras vocales secum habent coniunctas, proinde observandum est, ac sint semivocales [=f l m n r s x] aut mutae [=b c d g k p q t], ut a Venusia, a Ianiculo."[12]

Pronunciation of I and V

3.6 "Iotacism" is a frequent "barbarism" in ancient Rome. It is however, interpreted differently according to grammarians. For Marius Victorinus it is vocalic confusion and seems to have no bearing on depalatalization of consonants. For him, and for most Latin grammarians, iotacism is connected with the old "impure" sound between [i] and [u] that appears in the hesitations optimus = optumus, maximus = maxumus, etc. This sound is then compared with the [y] sound of Greek.[13] For Consentius, iotacism is a slightly different wrong pronunciation of /i/. The Gauls commit that mistake when they say ite with an /i/ "inter e et i"; the Greeks pronounce it too "thin."[14] For Pompeius, it is an entirely different phenomenon, connected with the palatalization of consonants (cf. below 3.10-3.11).

Pronunciation of X and Z

3.7 The letter X is "double." Flavius Sosipater Charisius writes: "... duplex est x. constat enim aut ex g et s, ut rex regis, aut ex c et s, ut pix picis."[15] This information, which tells little about its pronunciation, is repeated by all authors. There is, however, no ground to assert that X was not /ks/ in classical Latin. The value of Z is more difficult to determine. That "letter" is duplex like X, but it is also peregrina, from Greek.[16] The Commentum Einsidlense describes the value of "Z" in unclear terms: "Z pro duobus s vel pro sd ponitur quae ante eius assumptionem ita scribebantur, ut 'massa' dicebant pro 'maza' et 'Messentius' vel 'Medentius' aut 'Medientius' pro 'Mezentius'."[17] The alternations seem to reflect various pronunciations and not merely diverging spellings. Diomedes explains the relationship between "Z" and "I." It seems to be essentially an etymological one, as other symbols are used when there is no etymological relationship (*Artis*, pp. 422-423). The same author insists that "Z" is used only in foreign names. In Old Latin double "S" was used for the same purpose (p. 426). Longus has a different opinion. If one listens carefully, one can hear a slight difference between the Latin letters, or their Greek equivalents. It seems that the difference lies in the opposition, geminate (δσ, σσ, ss) vs non-geminate (ζ).[18] Marius Victorinus believes on the contrary that "z" = [ds]: "sic et z, si modo latino sermoni necessaria esset, per d et s litteras faceremus" (*Ars*, p. 6). Servius merely states: "... z pro duplici, quamquam apud nos z et pro duplici sit, ut 'Mezenti ducis exuvias' et pro simplici, ut 'nemerosa Zacynthos'." This description, vague insofar as it concerns the point of articulation, seems to attest that "z" in Me*z*entius is unvoiced, affricate or geminate, as against the voiced affricate of *Z*acynthos, a frequent spelling, even in Greek, for *Hy*acinthos.[19] Maximus Victorinus's opinion is very close to that of his homonym: "ut puta Hylas, Zephyrus, quae si *adsumptae* non essent, Hulas et sdepherus diceremus"; "quae si adsumpta non esset, per s et d Mesdentium [for Mezentium] scriberemus" (*De Arte grammatica*, p. 196). It appears that "z" = "sd" = "ds" = "ss"; the phonetic value of these symbols seems to be that of an affricate, whose point of articulation is not clear (see below, 3.14). It may be more fruitful to attempt to determine the value of Z from the other end:

from the palatalized sounds it symbolizes in Vulgar Latin. Here, a recent palatalization is involved. (For the Church Latin ending izare = idiare, cf. above, note 16.)

Palatalization. Consentius

3.8 Few authors mention the phenomenon of consonantal palatalization. Since Meyer-Lübke (cf. above, 2.9), reference has often been made to this statement by Consentius, interpreted as attesting a difference in treatment for /tj/ and /kj/: "alterum sonum habet i post t et alterum post c. nam post c habet pinguem sonum, post t gracilem" (Ars, p. 327). No examples are given, however. This passage does not say 'before an other vowel,' as Papirius and Pompeius (see below, 3.9-3.11) specify; there seems to be no reason to assume, with Marchot, Meyer-Lübke and others, that it is implied. This is especially true since Consentius, describing elsewhere confusions made by people of different linguistic background speaking Latin, makes a clear distinction between a "palatalizable" sequence (/tj/ in ETIAM), and an "assibilatable" one (/ti/ in OPTIMVS). He gives examples which clarify the phonological context:

> sed in aliis litteris sunt generalia quaedam quarundam vitia nationum. ecce in littera t aliqui ita pingue nescio quid sonant, ut, cum dicunt etiam, nihil de media syllaba infringant. Graeci contra, ubi non debent infringere, de sono eius litterae infringunt, ut, cum dicunt optimus, mediam syllabam ita sonant, quasi post t z graecum ammisceant (ibid., p. 395).

A possible interpretation of these two statements would be as follows. First, /ti/ and /ki/ have a different [i]: the [i] in /ti/ is "thin," i.e., the syllable in pronounced *[ti], whereas that in /ki/ is "fat," i.e., the syllable is pronounced *[cçi] or *[cši].[20] The second statement describes mispronunciations of /t/ in two different environments: before [j] and before [i]. The [j] in ETIAM is normally to be "infrictus" in ['ecça] or ['ecša], but some people have so "fat" a /t/ that they do not affricate it--and presumably say *['etja], *['et'ja] or *['eca]. On the contrary the Greeks affricate when they are not supposed to: they say *['optsimus] for OPTIMVS: they assibilate dentals before high front vowels.[21]

Papirius

3.9 Quintus Papirius's De Orthographia is almost totally lost; only seven lines are known. The first two, however, have been well known in Romance studies, as they seem to indicate affrication of palatalized sequences. They have generally been taken as decisive evidence in favour of the hissing channel:

> Iustitia cum scribitur, tertia syllaba sic sonat, quasi constet ex tribus litteris t z et i, cum habet duas, t et i. sed notandum quia in his syllabis iste sonus litterae z immixtus inveniri tantum potest, quae constant ex t et i et eas sequitur vocalis quaelibet, ut Tatius et otio iustitia et talia. excipiuntur quaedam nomina propria, quae peregrina sunt. sed ab his syllabis excluditur sonus z litterae, quas sequitur littera i, ut otii iustitii. item non sonat z, cum syllabam ti antecedit littera s, ut iustius castius (Keil, VII, p. 216).

The first remark here, to the effect that the "mixed sound" of "z" is to be found only if the letter "I" is followed by a vowel--i.e., is a glide--may be directed at reminding the Greeks that affrication does not take place before [i], but before [j]. It is not impossible that the "quaedam nomina propria" which do not affricate remain occlusive for a similar reason. It may be suspected that they are Greek words, and that their /i/, even before vowel, is in fact a stressed vowel in hiatus (see below *dies*, *meridies* in Pompeius, 3.10-3.11). Similarly, there is no reason to affricate *otii*, *iustitii*, which are, as in Modern Italian *['oti:], *[ɟ(ɨ)us'titi:] with no *yod* but a double, or long, *[i:]. As for the /stj/, it is understandable that affrication was delayed: *[ścś] is difficult to articulate (impossible, according to Pompeius; see below, 3.11), because the [s] tends to take the same point of articulation as [cś] and thus be a hush, hence *[ścś] or *[ʃṭʃ]. This pronunciation in turn is rejected by the speaking community, because of the pressure of analogy in the paradigm: iustus, castus, etc. The two would-be conflicting sibilants therefore prompt the temporary delay, and the /(s)c/ of *['ɟ(ɨ)usc̣us], *['kascus] remain occlusive slightly longer than the /c/ of IVSTITIA. Once this "heavy cluster" /sc/ has affricated, however, the occlusion may not be retained easily and the whole cluster tends to become [śś] (see below, 4.12). It is even possible that the pronunciation [śc] was insisted upon particularly as a [ścś] tended to alternate with [śś].

Pompeius

3.10 Pompeius must have been a keen language observer. His descriptions are clearer (and, generally more detailed)[22] than those of other Latin grammarians and often original--sometimes an old term is used to mean something he is first to describe. His accounts are accompanied by new examples.[23] It was suggested (cf. above, 3.8) that /i/ was actualized by its "thin"--*gracilis* (Consentius) or *tenuis*

(Pompeius)--[i] allophone in vocalic position, even after a /t/, whereas it was "fat"--*pinguis*--in non-vocalic position or after /k/. It was also assumed that this "fat" feature was a phonatic hush, CIVITATE and TITIVS being *[cšiβi'ta:te] and *['ti:cšus]. This hypothesis is supported by this passage previously quoted in part (above, note 20), where Pompeius explains that the /i/ in hiatus loses its normal value, acquires a *sibilus* and is auditorily maximally *pinguis*:

> itus, ecce tenuius sonat; si dicas Titius, pinguius sonat et perdit sonum suum et accipit sibilum. ergo quo modo dixit, sonant mediae, id est quod solae aliter sonant, aliter iunctae, idcirco dicuntur mediae, quoniam medium habent sonum, nec naturalem nec proprium (p. 104).

The phonetic actualization of this *medius sonus*,[24] "TZI" according to Papirius and Isidorus, may be reconstructed. For /i/ it cannot be [j] since [j] is a short [i]. The difference in length would have been unnoticed (as attested by the classical orthography) and it would not have sounded "vilis."[25] Pompeius states, moreover, that the /i/ in TIT*I*VS precisely "perdit sonum suum," and "sonum suum" of /i/ is either [i] or [j] (cf. above, 3.5). Thus Grammont's claim that: "les grammariens disent un peu plus tard que Titivs se prononce Tit*s*ivs" (cf. 2.8) is not merely a formal ellipsis but seems to be a mistaken view. TITIVS has *lost* its [j] in Vulgar Latin:[26] it is thus either *['ti:tsus] or *['ti:tʃus], or an intermediary sound between hush and hiss. The fact that Pompeius adds: "et accipit sibilum" cannot be taken as evidence that the friction was sibilant or hissing, since also to have a *sibilus* are some of the "semivocales" of Latin, i.e., "ef es ix" (*ibid*., p. 101). Moreover a [ts] would not be able to disengage a *yod*. Finally, a [c]>[ts] channel is phonetically improbable. It is suggested that Pompeius explains that [j] after a consonant has, regularly, affricated in [ç], and is probably often strengthened in [ś].

3.11 This description of the standard pronunciation is then compared with the barbarisms that it undergoes. The ms. is damaged and Keil supplied some whole sentences. The final text, however, is far from being clear and one wonders what Pompeius calls "iotacismus"; is it affrication or its absence? He notices a different interpretation of "iotacism" in *dies* and in *meridies*, which he thinks is due to the fact that there are preceding syllables in *meridies*. It is also impossible to affricate in *castius* ("nemo dicit, nec potest" [p. 286]). This is attributed to the fact that there is a *s* in the cluster. Thus *i* cannot affricate. Whatever pronunciation is considered an iotacism by Pompeius, what is important to note here, is his repeating: "in sibilum *vertendum* est... media illa syllaba *mutatur* in sibilum... sibilum... sibilum non *vertit*... sibilum *in ipsa i littera facere*" (*loc. cit.*; emphasis added). It indicates that the /i/ has affricated in this position, and that the TI or DI + vowel "syllable" has become a pure affricate and has lost--something not indicated by the spelling--its syllabic value. What was suggested above about *castius* (in 3.9) seems confirmed. The *dies* vs *meridies* difference in pronunciation must depend on the value--[i] or [j]--of "I," hence on the stress. Since stress, being automatically determined, was not noted in Latin, the cause of the discrepancy was not seen.

Greek and Latin Transcriptions

3.12 One may wonder why Latin grammarians themselves do not use "s" to symbolize the sibilus developed in the course of the Vulgar Latin affrication of palatals. It could be that the new sound is not a hiss (or a hish) as S. One understands why "z" is used in ZVNIOR, ZEBVS, etc.; "ts" would indicate that the initial cluster is voiceless, while it was probably voiced. But why does Papirius specify that the third (written) syllable of IVSTITIA "sic sonat, quasi constet ex tribus litteris t z et i"? It is possible that it was voiced, in which case one may wonder why "t" is written instead of "d" in a note concerned with pronunciation. It may perhaps be suspected that Z is used instead of S, because the point of articulation of the palatal affricate was different from that of /s/.

A Theory of Interpretation: From Phonemes to Graphemes

3.13 It seems that all known sound-oriented orthographies--or systems of graphemes[27] in a given tongue--more or less transparently reflect the tongue's phonemic patterns. When a language is first given a sound-oriented notation, the graphemes tend to reflect phonemic distinctions, and letter = phoneme. In the course of centuries, the initial equation tends to be blurred by two concomitant developments. As the sounds change, the graphemes do not cover the new distinctions (for example English has "o" in women, bomb, womb, comb) or cover dead distinctions (Modern Greek notes /i/, ι, υ, η, ει, οι). The spelling then becomes a system of reference to actual phonemic structures through ancient patterns. Trubetzkoy warns against erroneous identification of sounds through a graphemic misinterpretation based on an unsupported metachronic equivalence. Graphemes must be interpreted, not directly attributed the value of the sounds that they symbolize today.[28] For Latin sounds in particular, Meillet remarks that the letters that symbolize them must be interpreted all the more carefully as they seem to have been diverted from their original purpose by etymological and orthographical considerations. The transcriptions are doubtful because they are not reliable.[29] This alludes to the observation that Latin grammarians seem concerned with correct orthography rather than with accurate rendering of sounds. Migliorini sees the source of the grammarians' attitude in their systematic equation grapheme = sound--which had presumably become obsolete in Low Empire days ("L'intacco della velare," p. 275). This is not always true (cf. above, 3.10). Pompeius, for one, distinguishes between the sonus naturalis or proprius of a littera, and its sonus medius (hence the name media of those letters which have a second value). In fact it may be observed that some modern linguists made worse confusions in this respect than did Latin grammarians. As far as the notation of the palatal sound is concerned, modern works are hardly clearer and more unanimous than fourth and fifth century grammars. Migliorini regrets the confusion "nata della molteplicità delle grafie adottate dai linguisti per rappresentarlo" (ibid., p. 293, note 8).

The Lack of Palatal Symbols

3.14 Falc'hun explains the "multiplicity" in the same manner as Passy. The lack of appropriate symbols for palatal (and, later, hushing) sounds is the essential cause both of the ancient grammarians' approximations and of the contemporary discrepancies.[30] The same situation is observable in Breton.[31] Thus when Latin uses interchangeably CI and TI, GI and DI--or, in word initial position, I alone--before a vowel, it seems to indicate that the merger takes place, at the point of articulation of *yod*, and that these graphemes may be interpreted as the palatal [c] and [ɟ] respectively. When the spellings put a S or a Z instead of, or between, the consonant and the I, or when Papirius and Isidorus indicate the pronunciation with T*Z*I, it probably means that affrication of the palatal has taken place. Since the [j] has disappeared--as attested both by some spellings (see below, 3.15: ZEBVS, ZVNIOR, XVSTVS, etc.) and the repeated observations of Pompeius--there seems to be no reason to reject the more frequent channel of palatalization-affrication. The *yod*-transitions of Vulgar Latin palatals had been transformed into hushes. That symbols usually employed to designate hisses may be employed, by themselves or in combination with other symbols, to designate hushes, is shown by a great many orthographies. Standard English has *sugar*, *measure*, *Russia*, *Asia*, *ship*, *Solzhenitsyn*, not to mention *Czech*. Standard Dutch renders [ʃ] by "sj." This convention was adopted in Frisian; English *church*--Dutch *kerk*--is rendered as "tsjerk." Welsh has similarly "siop" for English *shop*. Catalan and Portuguese use "x" for /ʃ/.[32] There seems to be no positive reason why "si" + vowel could mean [ʃ] in English or in Welsh but not in Vulgar Latin.

The Forms that Indicate Palatalization and Affrication

Latin

3.15 The oldest form that seems to indicate affrication is CRESCENTSIANVS. Grammont acknowledges it without discussion: "noter qu'en latin on trouve sur les inscriptions dès le II^{e} siècle l'orthographe *Crescentsianus* pour *Crescentianus*" (*Phonétique du grec ancien*, p. 99). This CRESCENTSIANVS is in fact doubtful[33] (see below, 3.28), but a number of comparable forms are reliable: ZVNIOR for IVNIOR, IOSIMVS for Ζώσιμοσ are found in Pompei. In the second and third centuries there are[34] ZOSVM; ZEBVS, IBVS for DEORSVM; DIEBVS. IOSVM for DEORSVM, from the same epoch, is given by Maria Bonioli.[35] Graur discusses ZYBINNA and SIBYNA and observes that, since "Z" is used in Italian and German with the value [ts], it is not difficult to accept that it was attributed the same value by Latin copyists.[36] This value became standard after the ninth century.[37] Vittore Pisani discovers IOSIMVS for Ζώσιμοσ, IVMAE for ZVMAE and XVSTVS for IVSTVS in the Oscan region. After Mohl and others (see below, 3.31) he supposes that Vulgar Latin affrication finds its historical origin in the Oscan substratum. It was introduced in Latin in the first century A.D.[38] Jules Pirson presents numerous forms: MARSIAS for MARTIAS, TERSIO for TERTIO, SAPIENSIE for SAPIENTIAE, etc.; TERCIVM for TERTIVM, CONSTANCIVS for CONSTANTIVS, MILICIE for MILITIE, etc.; MINIKIVS for MINICIVS, PAKE for PACEM, etc., all in sixth or seventh century inscriptions in Gaul.[39] He finds such forms as GEIVNA for IEIVNAT, GEROSALE for IERVSALEM, GENARIVS for IANVARIVS and even GEORGIA for IVRGIA (p. 75), all forms attested around the same time. Also revealing are CAILVI for CALVIVS, DECVMAINVS for DECVMANIVS (p. 76); FILVS for FILIVS, EMELE for AEMILIAE, AVRELVS for AVRELIVS (p. 58); SANTVS for SANCTVS, DEFVNTVS for DEFVNCTVS (pp. 92-93). Gregory of Tours, (Clermont, 538-594) makes similar spelling "mistakes" in his writings; Max Bonnet quotes ZABVLVS for DIABOLVS, ZACONVS for DIACONVS, BAPTIDIARE for βαπτίζειν, REMEGIVS for REMEDIVS.[40] M. Deloche takes a sixth century OFIKINA LAVRENTI for OFFICINA LAVRENTII as evidence to support the hypothesis that Latin CI was still [ki] in the sixth century.[41] This hypothesis is approved by Pirson, who affirms that this "k" "avait certainement la valeur d'une explosive sourde," and by Giovanni Alessio.[42] Joseph Herman bases his study on fifth century dialectialization in Vulgar Latin[43] on forms such as BAPTIDIATA for BAPTIZATA, MARSIAS for MARTIAS, CONSCIENSIA for CONSCIENTIA, etc. Apart from the above mentioned CRESCENTSIANVS, "ts" seems unknown. This is not surprising, considering the fact that it does not "look Latin," and clerks were more concerned with orthography than with pronunciation. The few "k" might already indicate an attempt to restore a "better" pronunciation. Old French will soon use this symbol to represent /k/ before "i" and "e." It must be borne in mind, however, that, unlike "z," "y" and later "w," "peregrinae litterae," K has always been a letter of Latin, and that Merovingian texts are full of spelling "archaisms."[44] The forms presented in this paragraph in broad chronology cover in reality a period of about six centuries. There is no reason to assume that the fixity in spelling does not conceal many and essential changes in pronunciation, as, for example, the French orthography from Saint Louis to the Revolution.[45] A traditionally established spelling--an orthography--is like a chrysalid. It renders the vital changes unnoticeable until the metamorphosis has been completed and the envelope suddenly abandoned. But the changes took place little by little *within* the rigid cocoon. They may be reconstructed only by interpreting, in the light of what they have resulted in, the "mistakes," or departures from the norm in the same language, and from the transcriptions in other languages.

Classical and Hellenistic Greek

3.16 Greek has no equivalent to Latin C other than the historically related Γ and the phonetically similar K. Classical Latin forms with C are transcribed in Classical Greek with κ, and a tradition establishes itself. The 'Ουρσικίνοσ for VRSICINVS, Μοκίμοσ for MOCIMVS, Μαρκιάνου for MARTIANVS, Κυκναρία (for what?), Λουκιόλου for LVCEOLV given by Pirson (*La Phonétique*, p. 73) along with *an AKIANAE for ACIANAE* may not indicate anything. There is no reason why the Greek "κ" should be able to indicate more than Latin "C" or "K."[46] At least in one Greek dialect, Migliorini, "L'intacco della velare," shows "che il greco κ davanti ad ι ει è reso in copto verso il 350 d. C. con un segno che oggi vale *š*, ma che deve essere stato *k'* o *č*" (p. 299). Many modern Greek dialects have, from *k + j, i*, etc., [cç], [tʃ] etc.; these sounds are still rendered by the same letter κ. Since, so far, it has remained the same phoneme /k/ in Greek this causes no problem.[47] It would not have caused more problems in Vulgar Latin. The affricate *[ts] was probably not a phoneme until after the fall of the Roman

Empire. Besides, "c" symbolizes /s/ before "i, e" in French or Spanish, and this creates no difficulty, even though it has become a phoneme different from the /k/ it symbolizes in other contexts. Forms transcribed by other symbols might prove more revealing.

Accipiter - ὀζύπτερον

3.17 One folk-etymology (or pun?) has long been considered as evidence that Latin CI had assibilated by the time of the Antonines. In an epistle (X, 1 and 4) by Barnaby, who lived in the first half of the second century A.D., there appears a list of animals[48] containing 'οζύπτερον. Meyer-Lübke wonders if this is not an early example of palatalization and if the ζύ syllable of Greek reflects a palatalization in Latin CI. He suggests that the folk-etymology may be due to a phonetic resemblance between ζύ and CI, thus that CI was [tji] (p. 2). For Migliorini, on the contrary, this phonetic implication is difficult to admit as it appears chronologically improbable. The Latin velar + i must not have affricated as early as around 100-150 A.D. (pp. 286-287). But it must be emphasized that palatalization is not equal to affrication, in which case the opinions of Meyer-Lübke and Migliorini may be compatible. A [c] palatal occlusive may have been heard as [c] or [cš] according to social cleavages. Since it seems undisputable that classical Latin velar phonemes had palatal allophones [c,ɟ] before front vowels (see below, 3.29) it may thus appear probable that a popular pronunciation of the second century A.D. actualized these as affricates. This popular pronunciation would in turn account for the pun. But since the value of Ξ in Old Greek is unknown, the nature of the hypothetical Latin affricate is not rendered any more specific thereby. Besides, folk-etymology and puns are not necessarily based on complete similarity of forms. *Asparagus* did not sound exactly like *sparrow-grass* when the latter was created.

Byzantine Greek

3.18 The above mentioned *Papiri ravennati* (2.23) contain forms in "κ" as well as forms in "τζ." One reads Λουκερνάρια for LVCERNARIA, Κελλεριανά for CELLERIANA and Μαρκελλι[ά]να for MARCELLIANA: but Λούτζολο for LVCIOLVM and Μουτζιάνι Καστελλον for MVCIANI CASTELLVM (Migliorini, "L'intacco della velare," p. 287). Migliorini remarks that the phonetic context is different. It is E as against *yod* which seems to be the cause of the diverging spellings: "Qualche deduzione s'è tratta dalle trascrizioni dei papiri ravennati ... hanno permesso di *conchiudere* che l'intacco di *ci* era nel sec. VI più progredito di quello di CE, CI" (p. 287, emphasis added). This conclusion may not be the only legitimate one. Certainly the phonological context is different in Latin--and *yod* might very well have started its palatalizing influence before E, I did--but the graphemic context is different as well. That is to say, it may be understood, as in modern Italian, French, etc., that κ or "c" + η, ε, ι or "e, i" has a hushing or hissing value. There cannot be the same grapheme before "o" or "α," since, then, the reader would not be able to tell [tʃ](or [ts]) in *Λούκολο from [k] in κολλοφών. Here, another graphemic solution had to be provided; it may explain τζ. If this is true, the ι in Μουτζιάνι may be redundant--as, for instance, the cedilla in French *merçi*, *içi*, often found in popular spellings--but it may also be there in order to specify that the affricate is hushing, as in Modern English, Dutch, Welsh, Frisian etc. The fact that the cluster is usually symbolized with τζ, which symbolizes a hish in Modern Greek, does not prove that it was not hushing. Mirambel arrives at this conclusion after observing that "... le *tch* italien [was] toujours rendu par τζ dans les Assises (XIII^{e} siècle) et dans les Chroniques (XV^{e}) [of Cyprus]... ."[49] This situation has not changed in Modern Greek, where foreign hushes are still transcribed with σ and ζ: English *Jamboree* is τζάμπορη, French *bourgeois* μπουρζουά, etc.

The Graphemes and the Hushing Channel Theory

3.19 In order to symbolize the early results of the affrication of palatalized consonants and clusters, Latin used the graphemes SI, Z, I, X, G, GE: MARSIAS, ZVNIOR, IOSIMVS, XVSTVS, GEROSALE, GEORGIA, and in Greek τζ, τζι: Λούτζολο, Μουτζιάνι. TS and S seem unattested; so is Greek σ till Modern Greek (*chauffeur* is σοφέρ or also σωφέρ). Z is frequent in both languages, with SI, I and G (+ I, E) and GE (+ A, O, V) as well in Latin. Perhaps this was due to a desire to express that the results were not like S, hisses, but something else. The presence of I, after S or by itself, may indicate that the cluster was, as [i], medio-palatal or hushing. X, and ξ in δξύπτερον, the value of which was probably [ks] in CL, must be considered differently. For δξύπτερον, see above, 3.17. X in XVSTVS cannot be taken as evidence that the form was pronounced ['ksustus]. Such a pronunciation of IVSTVS appears unlikely. It seems that the only probable hypothesis that may be advanced here is that X meant an affricate. The principle according to which Latin and Greek transcriptions indicate hisses as the fundamental result of VL palatalized consonants does not take into account the fact that neither Latin or Classical Greek had letters to symbolize palatals and hushes. The principle on which this direct interpretation relies appears to be based on the old mistaken equation: letter = sound. Most graphemes in effect suggest that the reflexes of palatalized clusters were not [ts, dz]. There does not seem to be an incompatibility between a possible hushing channel and the ancient spellings of palatalized (and affricated) consonants and clusters.[50]

WORDS BORROWED FROM AND BY LATIN AND ROMANCE

Classical Latin

3.20 Most words borrowed by neighbouring languages, including Greek, in the early days of the Roman Empire, show forms where CI, CE were integrated as /ki, ke/. There are numerous examples; in Basque: CELLA > ['gela] 'cell,' NECE > ['neke] 'nut,' etc.; in Celtic languages: CELLA > cell 'church,' CERTV > cert 'right,' etc., in Irish; in German: CELLARIV > Keller, CERFOLIA > Kerbel, etc.; Serbo-Croatian CEPVLLA > kapula, CIRCINATA > krknata, etc.; Berber CICER > [ki:kɛr], CERA > [kir] etc. (Migliorini, "L'intacco della velare," pp. 281-288). For Greek, Migliorini generalizes on the observation that CE, CI is the standard transcription of κε, κι, and reciprocally: "Ad ogni modo, resta saldo quello che è l'argomento fondamentale per provare la pronunzia velare della C latina in età repubblicana e imperiale, cioè la trascrizione di κε, κι con CE, CI e viceversa" (p. 285). The similar use of the koph, in Talmudic inscriptions, to render c + i,e in Hebrew garb is taken by Migliorini as evidence to the same effect (loc. cit.). This argument is undermined, however, by the observation that Greek κε, κι itself has no velar pronunciation,[51] as well as by Migliorini's reasoning, according to which the choice of a velar in the borrowing language to render CI and CE does not mean that it was a velar in Latin if the borrowing language does not itself have a palatal, since a strange sound would be integrated under the form of its closest neighbour in the borrowing system (p. 280). Hellenistic Greek and Talmudic Hebrew are not believed to have had two or three such series.[52] Also, Migliorini remarks that the condition for the sound to be integrated as such is its coming "per via orale," something probable in most cases. What is left on the documents, however, is written. It may be that the learned people who wrote these documents were more concerned with a proper transliteration than with a phonetically accurate transcription.

3.21 Some words, apparently borrowed around the same period, reveal curious alternations. From CEPVLLA, Basque has [kipula] ≈ [tipula]; Cymric has cengl ≈ tengl from CINGVLA. Berber, which usually renders Latin C + i, e by [k] has [tsilkit] from CELSA.[53] Such an alternation [k] ≈ [t] before front vowels, Migliorini suggests, may be the reflex, in the borrowing language, of an intermediary sound in the original (p. 290). This would have to have been the palatal [c]. One may also embed the velar ≈ dental alternation in the socio-linguistic reality of Classical Latin, and suppose that the higher classes had a [k] or [k'] allophone as against the [c] or [t'] of the lower classes, whence the choice in the borrowing language. It seems clear at any rate, that the alternations reflect a *[k] ≃ *[t] maximum range of variation *in Latin* for velar phonemes before front vowels, since such phonological alternations appear unknown in the languages where they now appear in lexical doublets. The *[c] necessary in Latin to account for these discrepancies is not only plausible by itself, since Romance languages have sibilant reflexes of it, it also corroborates a chronological hypothesis based on phonological conditioning in Old Latin (see below, 3.29-3.31).

Gallo-Romance

3.22 At the other end of the channel, in Old French, the *[c] has become [ts]. Modern French has [s], and words borrowed from both Langue d'Oïl and Langue d'Oc cultures during the 11th and 12th centuries have [ts]. Nyrop gives the German borrowings *zinc*, *zendal*, *merzi*, *puzele*, *fianze*; the Dutch *fortse*, *fatsoen*; the Hebrew *tsindre*, *pietze*, *fortze*, *montsiel*, etc. (*Grammaire historique*, p. 400). The question concerns the phonetic nature of the Gallo-Romance Proto-Francien reflexes of *t + j*, *k + j, i, e* during the nine centuries that separate the first invasions and the decline of the Empire from the Classical Old French period of the 12th and 13th centuries. The value attributed to letters by Carolingian clerks is certainly an indication of the manner in which *they* pronounced them *in Latin*, but this pronunciation may have depended on the statements of Latin grammarians as much as on the popular speech. It seems, in particular, that the learned pronunciation, [tsj] for Latin TI + vowel: *nation*, *bénédiction*, etc. as [na'tsjõn, benediktsjõn], stems from the same interpretation of Papirius as was made by modern philologists. This renders it necessary to wait until the 11th century before having reliable phonetic values of popular forms. As Migliorini regrets, there is no reliable attestation for the periods during which most changes occurred, and when there is something, it is about Latin, not about the Romance language ("L'intacco della velare," p. 276).

3.23 In the absence of reliable phonetic information on Proto-Francien Romance, borrowed *popular* forms may indicate its pronunciation indirectly to the extent that their original dialects may be recognized as those of Ile-de-France. The hushing forms attested in Balkan Latin, and Slavic languages, such as CERESEA > ['tʃrɛtʃa], CISTERNA > [tʃetrɲa], CRVCE > [kriʒ], etc.,[54] cannot be taken as evidence of a hushing stage in Proto-Francien. The Basque forms [zokor] = [tʃokor], given by Johannes Hubschmid[55] as remnants of pre-Romance words scattered in Western Romance today: Italian *ciocco*, French *souche*, etc., do not indicate much either.

Cerlier - Z(u) Erlach

3.24 The Swiss village of Cerlier (Canton: Bern) is called Erlach in the Germanic dialect of the region. Meyer-Lübke, *Einführung*, and Mohl, in his review of this book, suggest that the Germanic name results from a wrong division of the Romance form of CAERELLIACVM, pronounced with an initial [ts], and thus interpreted as *Z*(u) + Erlach (Mohl, p. 595).

This explanation is also admitted by Migliorini "L'intacco della velare," who, however, does not conclude, either tentatively, as Meyer-Lübke, or more firmly, as Mohl, that the Romance dialect must have had a hissing affricate for C + E at the time of the Germanic invasion, in the second half of the third century A.D. (p. 284). The reconstruction Z(u) + Erlach was not accepted by Wilhelm Kaspers. Alternations "Ch = H = ɧ = C" in the spelling of Germanic names are frequent, and throughout the Middle Ages Erlach is written HERILACO = HERLIACO.[56] Thus it appears more plausible that the Romance form, at the time of the invasions, had a velar "mit einem spirantischen Element" (p. 496)--[cç]?--which developed into [x] = [h] = [ɧ] in the Germanic dialect. This channel seems probable, as the interpretation of [cç] in [k'x] and then [k'x] > [kχ] > [χ] > [h] > [ɧ] is plausible in a Germanic dialect. The [cç] > hushing channel > [ts] is plausible for the Romance dialect. Meyer-Lübke, Mohl and Migliorini agree that (hissing) assibilation must have taken place early in Northern Gaul. Meyer-Lübke's reasons are: ACCIPITER-δζύπτερον (cf. above, 3.17), *Cerlier - Zu Erlach* and *Rikhild* > *Richeut*.[57] Mohl insists that these examples are not decisive. *Richeut* in particular may be an analogical backformation ("Review of Meyer-Lübke, *Einführung*," pp. 593-595). But, he adds, assibilation must be an ancient phenomenon, otherwise CRVCE would not have given the similar *kross* in Old Icelandic, *cross* in Old English or *Kreuz* in Old German. This example, again, may not be conclusive. If Old Icelandic, Old English and Old German had no hushes, their borrowing CRVCE with a hiss means nothing (cf. above, Migliorini, 3.20). Therefore Migliorini bases his own conclusion on another type of evidence, similar to Meyer-Lübke's third argument. There would have been a merger with the Germanic (hushing) reflexes if assibilation had not been completed when the Frankish invasions took place ("L'intacco della velare," p. 281).

3.25 But can one not envisage that when the Germanic words entered Gallo-Romance, Latin *T + yod*, *C + yod, i, e* had still palatal ≈ hushing actualizations? These later differentiated into hisses, possibly in order to avoid merger with the new palatalized sounds. These in turn followed the same channel and stopped at the hushing stage. Why should Latin *T + yod*, *C + yod, i, e*, which certainly was no longer *[k]—otherwise it would indeed have merged with the Germanic velars—have already been hisses? *Housse*, *échasse*, *échanson*, *maçon*, etc. < Frankish **hulftja*, **skakjo*,[58] **skankjo*, **makjo* are difficult to explain if assibilation has been completed by the time of the Frankish invasions. (See the discussion below, 4.21.)

3.26 The preceding lines do not prove the existence of a hushing stage in the development of the Vulgar Latin palatalized clusters in Proto-Francien. But they show that the hushing channel of development, which is not incompatible with Romance or Gallo-Romance in general, can be applied to the problem raised by the integration of borrowed words in Proto-Francien. In effect, if the exceptional hissing channel of development is postulated for the hereditary forms and is, according to Meyer-Lübke, Migliorini, etc., completed by the time of the invasions, it has to be postulated *again* (for *hultja*, *makjo*, etc.) when the Germanic words are assimilated. If the hushing channel is admitted, on the contrary, hereditary and foreign forms can undergo the regular evolutions palatal > hush (> hiss) together, in a way which is at the same time phonetically more acceptable, and phonologically clearly structured (see below, 4.31). This type of evidence is one of the strongest available to support the hypothesis of a hushing stage in Proto-Francien. For it is possible that the hushing form of Modern English *cherry*, *March*, etc. is due to their being borrowed from Norman, both for historical and linguistic reasons, since *camp*, *cash*, *cat*, *castle*, *cattle*, etc. appear Norman.[59] Charles H. Livingston even suggests[60] that the hushing forms of *brush*, *frush*, *leash*, *cash*, *bushel*, *crush*, *usher* and *mushroom* do not necessarily attest a hushing form in the dialect from which they were borrowed; they could have developed the hush from *j + s*.[61] Other hushing forms in Romance dialects, as in Walloon and Lorrain, and in non-Romance dialects, e.g. the Plat-Deutsch *patois* of Eastern Netherland and Belgium or Alsatian can be traced back to a non-Francien origin. Often the embryonic hush of Germanic forms such as [cçiRʃ] for German *Kirsch*[62] seems to be a recent palatalization of a form borrowed with a velar, as shown by the similar process in *Kirche* [cçiRç]. The hypothesis of a hushing stage in the development in Langue d'Oil of the Vulgar Latin palatalized clusters is thus not definitely attested, but this does not imply that it is an improbable and worthless speculation. In the same way, the palatalizations themselves are not directly proved and cannot be observed, but they still remain a valid hypothesis. The hushing channel may thus be acceptable as a working hypothesis regarding the development of the palatal subsystem from Classical Latin to Francien. In order to clear the ground for the functional reconstruction, a first chronology, based on traditional methods, is outlined below.

A FIRST RECONSTRUCTION: BROAD ABSOLUTE CHRONOLOGY

Palatalization and Affrication of Dentals + Yod, Velars + I, E, AE

3.27 When did t, d + j and k, g + j, i, e start having distinctly palatalized allophones as against plain [t, d, k, g] in other contexts? Opinions vary greatly: from Old Latin for some, as late as the seventh century for others. After Meyer-Lübke, it was generally agreed that the alteration must have begun during the Imperial age. After Richter it was recognized that from [k] to [ts] many steps had been necessary, and that the whole development must have taken a relatively long time.[63] For Straka, palatalization comes after sonorization,[64] and sonorization must have taken place "aux environs de 400" (p. 285). However, his chronological chart (pp. 304-305) has a [t'] from the first stage mentioned, early imperial CL.[65]

Crescentsianus

3.28 The currently accepted chronology may be based on a misunderstanding. Hirschfeld and Zangemeister, thanks to whom the second century inscription CRESCENTSIANVS has become known in Romance and Classical studies, indicate that this reading is unreliable (CIL XIV, no. 246). Paul Meyer recalls this warning and takes the form as a false example of the alleged affrication of palatalized sounds in Latin. In his view the affrication occurs in Romance.[66] This opinion is shared by Densusianu, who, in his review of Meyer's article, explains that, even if C + j, i, e is already (the palatalized) [k'] in Vulgar Latin, this is impossible to prove. What is important, in his view, is the fact that before the Romance languages develop, it is not an affricate yet, [tʃ] or [ts].[67] As far as the contradictory evidence CRESCENTSIANVS is concerned, Densusianu agrees that the most plausible reading seems to be CRESCENTIANVS. But affrication and palatalization are not the same phenomenon, although one usually follows the other closely.

Linguistic Evidence for Early Palatalization of Velars

3.29 In effect, it seems that t, d + j and k, g + j, i, e were altered in the Latin spoken during the Empire, most probably even long before, in Republican times. A first type of evidence in support of a serious alteration is philological: the merger, in the spelling, of T, D and C, G followed by yod. These mergers become frequent during the third century. The equivalence "Z" = "I" in initial position already attested in Pompei also seems to indicate consonantalization of the semi-vowel [j], and perhaps affrication (cf. above, 3.15). Since it is difficult to believe that [kj] had become [tj] or vice-versa--both from the point of view of the spellings (both CI and TI are found) and of phonetics--it seems reasonable to accept that the two sounds met somewhere in between, perhaps in the middle, at the point of articulation of [i], and that they merged in [c]. The similar hesitation G ≃ D + [j] and the equivalence *Z = I* may indicate the voiced counterpart of the [c]: [ɟ].

In a converging manner, there is some other kind of evidence which supports the hypothesis that *C, G + i, e* had reached that point of articulation by the time when a following *yod* had merged dentals and velars, and initial *yod*, into palatals. Old Latin -EL- becomes -OL- (exceptionally -VL-): (H)ELV > (H)OLV, VELLE but VOLO, etc.[68] Yet *SCELVS, GELVS, etc. have retained their palatal vowel*, in spite of its being followed by a velarizing [ɫ]. Meillet explains this by the palatalization of the preceding velar. Since the -EL- > -OL- change occured in Old Latin, *palatalization of velars before front vowels must be an Old Latin phenomenon*: "... ces faits ... sont de grande portée si, comme je l'ai enseigné,[69] ils indiquent une prononciation pré-palatale - ce qui ne veut pas dire palatalisée - de *c*, *g* devant *e* dès *une époque préhistorique du latin*."[70] It seems strange that Meillet should insist on the right interpretation of prepalatal as being distinct from palatalized, especially since the new *pre*palatal sounds came from a *velar* stage. Does not *palatalized* mean 'made (more) palatal'? In which case, a palatal is a completely palatalized sound, and a palatalized sound *precedes* a palatal one. Or perhaps he means palatal as against "palatalisée," which might be understood as *affricated*, the former word being often understood as implying the latter. While it is difficult to accept, on the other hand, that [t', d']--"prepalatal" occlusives--should have been regularly borrowed as velars and only exceptionally as dentals, it is probable that this would be the case if the velar phonemes had mediopalatal allophones before *j, i, e*: [c, ɟ]. The answer seems to be that Meillet calls prepalatal the point of articulation of [k', g']. It may be understood as post- or mediopalatal, since he explains elsewhere: "[This palatal articulation] n'implique naturellement pas que les gutturales aient dépassé le stade de la *prononciation très prépalatale* *k'*, *g'* ...."[71]

3.30 Whatever the exact point of articulation of these occlusives may have been, their action on a following vowel appears as early as in Old Latin; "... il en résulte évidemment que ce stade [palatal] était atteint dès avant la période historique du latin" (*loc. cit.*). The palatal stage explains the velar of Sardinian and Dalmatian as well as the affricated reflexes of the other Romance dialects (*loc. cit.*). It thus seems likely that /k, g/ had palatal allophones before [j, i, e] in Old and Classical Latin. The impact of this evidence on the chronology of the so-called "Vulgar Latin palatalization" is certainly great. If the standard actualization of these is something like [c, ɟ] in Classical Latin, Vulgar Latin will merely have to "alter" to result in the Romance affricates. Since this change occurs "very easily" (*loc. cit.*), it is understandable that the popular classes of the Empire might have had, in ordinary conversation, a tendency to affricate. This, in turn, might conceivably have triggered a reaction among some other classes.[72] The fairly long "survival" of the palatal occlusives, possibly throughout the three centuries of Pax Romana, would then be accounted for, as well as the simultaneous blossoming of affricates all over the Romance world when the ancient civilization collapsed, in the fourth and fifth centuries. Even then, an archaic pronunciation may have characterized the speech of the--now very few--learned people. The palatalization of velars before high front vowels in Old Latin has not been generally acknowledged (loc. cit.). In Romance studies at least, it might sound revolutionary, even today. In 1922, Meillet, in his review of Ringenson's Etude ... en français, complains that the author, being a Romanist, ignores it (p. 81). Apart from Straka's ambiguous position (cf. above, 3.27), in Romance studies, it seems that only Alf Sommerfelt has acknowledged[73] this important reality concerning the nature and the chronology of palatalization in Latin.

3.31 In effect, one Italic dialect close to Latin genetically (and linguistically) as well as historico-geographically, Osco-Ombrian, had not only palatalized, but affricated (in hushes) the allophones of its velar phonemes before high front vowels and yod during the Republican era in Rome. According to Mohl, the affrication that he postulates as general for Vulgar Latin finds its source in an expansion of the lax Osco-Ombrian pronunciation generalized in the time of Augustus.[74] This quantitative appreciation may appear to go too far. As Meillet points out, it is a palatal occlusive pronunciation that best explains the rapid and similar affricating developments in most Romance languages and at the same time its independent regression to [k] in Sardinian and Dalmatian, as well as its velar and dental occlusive reflexes in borrowed forms. If a hushing affricate actualization of [k'] in Rome is dialectal in origin[75] and, with the rise of the Empire and the subsequent massive immigration of Italians to VRBS, rustic and "substandard" in every respect, there is some reason to conjecture that an upper-class reaction may account for its long-delayed generalization. During the first three centuries of the Empire, this socio-linguistic cleavage might have spread out of the Peninsula, and contributed, among other phonetic peculiarities,[76] to the growing distinction between natural, popular, "vulgar" Latin and learned, ultra-polished, "classical" Latin. It is not impossible that, at one time around the end of the Empire, the popular and, *then*, generalized, pronunciation was [cš], whereas, by hypercorrection, some educated people retained a [k]. There are similar situations today. For example, a British lady would pronounce *pictures* ['pIktyəz] consistently[77] while a popular American pronunciation indicates ['pIcšəz] as well as ['bɛcšu] *bet you*, ['wuǰžu] *would you*? [δIšçə:] *this year*, etc.

Palatalization and Affrication of Yod, Labials + Yod, Velars + A

3.32 *Yod* is the palatal sound *par excellence* and cannot be palatalized. But when did it develop from a glide into a consonant, occlusive, affricate or fricative? According to the inscriptions, it merged with [dj], [gj] and ζ during the fourth or fifth century. The new sound was probably the voiced counterpart of that discussed in the preceding section. There would be little problem if, unlike Tuscan, most Romance dialects had not separated it from its voiceless counterpart, with regard to their point of articulation, in initial and post-consonantal position: raison and ciel have hisses vs the hushes of jamais and argent. This suggested to Passy a chronological hypothesis based on the idea, later developed by Dauzat,[78] that the hush must be due to an early deaffrication of the voiced hushing affricate.[79] This hypothesis is weakened, for French, by the Picard forms tcherf (= French cerf) but crois, nois, as in (Old) French. See the discussion in 4.17.[80]

3.33 Labials + yod and k, g + a appear to have palatalized around the same time, since their results are similar in Langue d'Oïl dialects: all are hushes. It is not surprising that labials palatalized after velars and dentals. Their point of articulation is much farther from the palate than the latter, and, while there is an articulatory continuum from the velum or the alveolas to the middle of the palate, there has to be a "leap" from the lips to the palate. The affrication of the former can rightly be viewed, articulatorily speaking, as the affrication of a palatal consonant, i.e. [t, k + j] > [c] > [cš]. The affrication of labials is more correctly understood as the consonantization of the yod, followed by the abrupt assimilation in point of articulation of [p] by [š] in [cš], i.e., [p + j] > [pš] > [p(c)š] > [cš]. Forms such as sapcha, repropcha, etc. in some Franco-Provençal dialects, alternating with saptcha, reproptcha in others illustrate this channel.[81] Velars do not appear to have completed their palatalization before [a] till after the Frankish invasions, since Germanic k, g + a (and + i, e as well) undergo this phenomenon with the hereditary forms. (For Germanic t, k + j, see 3.25) Some scholars believe that all palatalizations occurred at the same time in Gallo-Romance, and therefore prefer to talk about *palatalization*, in the singular, in Gallo-Romance. This is Hatzfeld and Darmesteter's opinion: CI, CE became [tʃ] around the eighth century, and [ts] in the twelfth; CA similarly [tʃ] between the sixth and the eighth century (*Dictionnaire général*, p. 138). Then, supposedly, it is the context that explains the difference in result: the [tʃ] > [ts] development of the former. This conception seems shared by Dorfman: /ts/ + /e, i/ = [ts], while /ts/ + /a, au/ = [tʃ]. Hushes and hisses are combinatory variants.[82] If this is true it seems difficult to account for the hushes before /i, e/: *échine* from Germ. *skina* > [^{e}s'tʃiːnə],[83] *guichet* from *wikkett* > [gwi'tʃɛt], *brêche* < *brecha*, *rochet* < *rokko* + *ettu*, *riche* < *rikki*, *poche* < *pokka*, etc. And conversely it may seem that Proto-Francien Romance has hisses before /a/ in MATTEA > ['matsə] *masse*, FACIA > ['fatsə] *face*, etc., as well as before /o/, /u/: LECTIONE > [lɛ'tsõn] *leçon*, MATTEVCA > [ma'tsu^{j}ə], *massue* etc. A wave of palatalizations different from the first, Latin one, may thus appear more economical and perhaps more probable, philogically and phonetically. Martinet arrives at the same conclusion, based on the observable reflexes.[84]

3.34 This second, Gallo-Romance palatalization of velars + a occurred at a time difficult to specify. In the "Cantilène de Sainte Eulalie," CAVSA is written "cose." Darmesteter believes that it must be a palatalized velar [k']; not an affricate yet, otherwise it would not be represented by "c," nor [k] anymore, otherwise it would not palatalize ("Review of Joret, *Du C*," p. 392). Soon afterwards the grapheme "ch" is used, in both Langue d'Oc and d'Oïl texts, including Picard, where there is now [ʃ] or [ts], except in the latter dialect, which has [k]: CAVSA > *cose*, CAMISIA > *quemise*, etc. For Paul Meyer, in Southern Gaul the new grapheme has symbolized a hushing affricate since the eleventh century.[85] For Langue d'Oïl, Lücking and Paris believe the "ch" in "La Vie de St Léger" to mean a similar [tʃ]. According to Paris, Picard then underwent a regression [tʃ] > [k]. But to Schuchardt and Suchier, the first value of "ch" is in line with that of the Occitan, including Catalan, graphemes "lh," "nh": that of a palatalized cluster, [kj]. It is the [kj] value which explains [ka] in Norman-Picard, [tʃa] in other Gallo-Romance dialects, observes Suchier.[86] This conclusion is parallel to Meillet's conceptions of the reflexes of Vulgar Latin [c] in Romance dialects: [ki, ke] in Sardinian and Dalmatian, [tʃi, tʃe] or [tsi, tse] in other dialects (cf. above, 3.30). It seems probable that the first value of "ch" was thus [c]. When it affricated in [cš] in Francien is another question. Again, there is no reason why the two extreme actualizations, as well as all the intermediary ones, would not have co-existed for a certain length of time. On the other hand, the departure from [cš] to [tʃ] is indicated when the postconsonantal *yod*-transitions disappear from the spelling: *giel*, *chièvre* > *gel*, *chèvre*, etc., or on the contrary become autonomous: *chier*, *chien* < (CA)CARE, CANE.[87] As André Burger interprets it, this means that the hush has depalatalized.[88] This seems to imply that the mediopalatal dorsal hushing affricate [cš] has strengthened in the prepalatal apico-retroflex [ṭʃ].[89] Then, he interprets the vowel in a way that seems to contradict his hypothesis concerning the palatalization of the consonant. He believes that the vowel too was palatalized, and later depalatalized (*loc. cit.*). But the loss of [j] in *chièvre* > *chèvre* cannot show two different things at the same time: loss of palatalization in the consonant, and loss of palatalization in the vowel. It seems as though Burger had forgotten that palatalized vowels are unknown in Western Romance. The [j] in *chièvre*, Picard *quièvre* belonged to the consonant only [cšɛvr, k'ɛvr], not to the vowel, otherwise Francien *ciel*, *miel*, *fiel*, etc., Picard *chiel* would not have retained their [j], but would be **cel*, *mel*, *fel*, *chel* respectively.[90]

Sonorizations and Lenitions

3.35 The first, "Romance," sonorization is believed to have taken place in the sixth century by Meyer-Lübke (*Beiträge*), Marchot, and Bourciez (*Précis*), around the end of the fifth century by Bourciez (*Eléments*) and Dauzat, in the beginning of the fifth century by Meyer-Lübke (*Grammaire des langues romanes*, I); between the fourth and the seventh century by Richter, who seems to specify the beginning of the fifth century (*Chronologische Phonetik*, pp. 155-161). This last chronology is adopted by Straka,[91] who believes that Richter has proved, by a sufficient number of examples, that sonorization begins to appear near the turn of the fifth century. Elsewhere he conjectures that it might have started around 400 (pp. 285, 305). Some scholars, however, believe it to be an older phenomenon.

A. Zimmermann not only notes plenty of sixth century forms such as EPICADVS for EPICATVS, NOVADVS for NOVATVS, AMATA for AMADA (ATHENA), etc., in Gaul mainly, but also an unexplained IMVDAVIT in Portugal, in 462, and DONADA, apparently for DONATA, in Pompei, thus before 79 A.D.[92] He tentatively suggests that IMVDAVIT is a mistake for IMMVTAVIT. This suggestion is accepted by Maurice Jeanneret, but rejected by Jud,[93] who thinks that a hapax proves little and that sonorization cannot have happened so early. Jud suggests (pp. 551-552) that dropping one line in "nn" (= NN) would result in "m" (= M); hence his proposal of IMVDAVIT for INNVDAVIT, which seems acceptable semantically as well. Schuchardt[94] bases his more ancient chronology on some other examples, such as a PVDORE for PVTORE in the third century. Wartburg[95] finds Schuchardt's examples convincing and suggests that sonorization became generalized during the third century. He concludes that the stable pronunciation found today in Occitania and in Iberia, where the voiceless stops have sonorized in intervocalic position, must have been standard by the fifth century (p. 66).

3.36 In Langue d'Oïl a second lenition takes place, which further transforms the intervocalic stops. CL -P- merges with the reflexes of Latin -B- (or V-): CVPA > cuve as FABA > fève (and VINV > vin). The velar -C-, i.e., CL [k] either merges with the reflexes of Latin [ɗ] and [g] (before A): BACA > baie as BABTIDIARE > bateier and PAGARE > payer, or lenites out (before O, V): SECVRV > sûr. *[c] does not undergo the second lenition:[96] VICINV > voisin. -T- lenites out: MATVRV > mûr. The second lenition does not seem to have been completed until 842, since the Oaths of Strasbourg still have fradra < FRATRE. The terminus a quo is not far either. Ferdinand Lot has found a veant < VIDENT in the Chart of Mâcon.[97] There is no reason to believe that the CL voiceless dental was different by then. In fact, once again, analogy with contemporary sound changes helps to realize the possible nature of the Romance phenomenon. Scottish English has a normal [ʔ] allophone of posttonic intervocalic or postnasal /t/. In the same context, American English similarly has a now standard [d], at times [ɾ] or [ɾ̃] allophone. For example, latter is usually ['lædə^{r}] as ladder, often ['læɾə^{r}], in which case ladder is pronounced in the same manner; renting and bending usually merge in [-^{e}ɛneŋ] = [-^{e}ɛnIn]. Yet very few spelling mistakes attest the current pronunciation, not so much as a result of literacy as of the (implicit) knowledge that these are standard or substandard allophones of /t/ or /d/ phonemes which can still be heard in certain solemn circumstances or in the speech of British people, or of people imitating them. This situation, apart from the fact that Vulgar Latin sonorized all intervocalic[98] consonants, not just dentals, may well be a kind of "model" for the Romance phenomena. It is possible that educated classes kept their voiceless actualizations quite late in the Imperial age, keeping them apart from the voiced consonants, but the popular pronunciation was the standard one to survive in Ibero- and Gallo-Romance after the invasions. Finally, during the French "iron century" (ninth century), only the rustic way of speech spread over the whole Langue d'Oïl society and was instrumental in bringing about the final loss of intervocalic dental (and velar occlusives before *o*, *u*), thus departing from Latin more than any other Romance dialect.[99] There is one important difference in the two phonetic channels. Modern American English has the allophones [t], [d], [ɾ], [ʔ]. Old French, like contemporary Castilian, must have had a spirant stage [ð]. This [ð] seems to be attested both by the spellings in "th"--the grapheme of Old and Modern English /ð/ or /θ/ in *this*, *thaw*--and by the [f] in *soif*, which seems to be an (expressive?) strengthening of a final [θ](<[ð]) in SITV, from SITIRE 'to be thirsty.' The simplification of geminates follows the sonorization since there is no merger. When Germ. *hatjan* is assimilated as *[ha'ti:rə], simplification of geminates has not taken place yet, otherwise there would be **hatir* today, similar to *route* < RVPTA. *Haïr* is the result of the whole range of the /t/ allophones in Proto-Francien Gallo-Romance: [t], [d], [ð], [ʔ]; the last one became standard. When the Normans introduce the Anglo-Saxon word [ba:t], the various processes of lenition have been completed, since the word is *bateau* not **beau*, today.

Deaffrication and Disengagement of Parasitic i

3.37 The two phenomena of deaffrication and disengagement of a preconsonantal *parasitic i* have sometimes been viewed as complementary.[100] There is no *parasitic i* before Old French [ts]: *masse* < MATTEA, *fasse* < FACIAT: but before [ss] and [z] < palatalized consonant and clusters: *vaisseau* < VASCELLV; *voisin* < VICINV, *raison* < RATIONE, as *baisser* < BASIARE. According to Marchot, *Petite phonétique*, II, 71, it is necessary that the clusters deaffricate to allow the *parasitic i* to palatalize again the--now fricative--consonant, in Walloon. Namurois *vijin*, Liégeois *vihin* ≈ *vèhin* suppose the stages [vi'ʒẽ] < *[vizjẽ] < *[vejzẽn] < *[vejdzĩn] < VICINV. This theory is discussed in 4.5-4.11; linguistic economy may solve some of the problems raised by the distribution of this *yod* and its effects in various dialects of Langue d'Oïl. The date when a (phonetic) *yod*-transition appears *before* a palatalized consonant or cluster is necessarily as ancient as palatalization itself, but its becoming autonomous, functional (phonemic) or, as the word expresses it, *disengaged* from the consonant or cluster, is difficult if not impossible to locate chronologically without at least implicit notions of functional phonetics, i.e., phonology.

NOTES TO CHAPTER THREE

[1] *Grammatici latini ex recensione H. Keilii*. For manuscript sources and criteria as to the choice of the reading, see volumes I, i-xliii and VIII, i-cl. The reading of other manuscripts is given in footnotes, along with references to their origins. The regular reading will be used in this study. Volume VIII was edited by Hermann Hagen.

[2] Many mistakes are misprints, omissions or repetitions which cannot reveal anything phonologically relevant. Underlined and bracketed words are reconstructed by Keil or Hagen.

[3] The examples are discussed in Keil, I, i-xliii.

[4] This hypothetical palatalization is confirmed linguistically by the mergers observable today in virtually all Romance dialects.

[5] According to the Latin graphemic system, TI + consonant means only /ti/, and this is still valid in most Romance orthographies, since /ti/ itself has remained unchanged. For example, TIBERIM, *PITTITTV, ARTICVLV, *TIRARE are Tibre, petit, orteil, tirer in French. The exception "TI" for /ki/ in AMITITIA may be due only to a similar value in the following "syllable," AMICITIA.

[6] Such a description perhaps explains Grammont's severe judgment on Latin grammarians: "Les grammairiens latins ... nous ont dit si peu de choses, et ils ont si mal observé leur langue que leurs témoignages sont le plus souvent à peine dignes d'être pris en considération."

("Note sur l'article d'Ascoli, 'Ancora della sibilante tra vocali nel toscano,'" p. 335).

[7] As in Modern French, versification reflects an earlier stage of the language: *nation*, *tuer*, *ambition*, *nuage* are always pronounced in syneresis today, but they were not in the Middle Ages. This is reflected by the dieresis, still admissible in contemporary French poetry, compulsory in classical times.

[8] *De Arte metrica. De orthographia*, p. 229; emphasis added. This verse may be scanned only as:

/--uu/--uu/ -- -- /--uu/ --uu/ --u/.

[9] *Ibid*., p. 249. Respectively:

/-- -- / -- -- / --uu/ --uu/ --uu/ --u/ and
/--uu/ --uu/ --uu/ --uu/ --uu/ --u/.

Cf. also Velius Longus:

"et *ia*cit, anectae mentes stupefactaque corda"

(*De Orthographia*, p. 48), to be scanned:

/--uu/-- --/ -- --/ --uu/ --uu/ --u/.

[10] *De Orthographia*, p. 103.

[11] *Artis grammaticae*, p. 422.

[12] *De Orthographia*, p. 30. "a Venusia, a Ianiculo": the semi-vowel elides the /b/ of *ab* as a consonant. All this is attested *passim*. Cf., for example, Victorinus (see note 13 below); "ita fit ut eadem nunc (u) vocalis sit, ut unus, nunc consonans, ut vivus. sic et i nunc vocalis est, ut Iris, nunc consonans, ut ieiunus" (p. 7).

[13] *Ars grammatica*, pp. 19-20.

[14] "Exilius hanc proferunt." *Ars*, p. 394.

[15] *Artis grammaticae*, p. 8.

[16] The value of ζ in Classical Greek is unknown. "There is no agreement as to what its pronunciation must have been, say, in Athens in the fifth century B.C." (see Martinet, "A Project of Transliteration of Classical Greek," p. 155) Most scholars, though, agree that it was basically [dz]: see Grammont, *Phonétique du grec ancien*, pp. 99-104; J.B. Hofmann, *Etymologisches Wörterbuch des Griechischen*, pp. 101-105. Passy, *Etude sur les changements phonétiques*, and François Falc'hun (see below, 3.14), however, suggest that the dialectal variations attested by the various spellings: ζ, δι, σσ, ττ, τ, etc. reflect not so much basically different sounds as different ways of symbolizing a palatal, voiced or unvoiced, occlusive or hushing. This is all the more plausible since the source of most of these clusters is a palatalization. Xavier Mignot, "Un cas d'adaptation phonétique: le suffixe grec -ίζω en latin," p. 290, starts with the hypothesis that -ίζω, which developed from -ιδ- or -ιγ- + jω (nominal themes and suffix), through an unstable stage, had arrived, in Hellenistic Greek, at a "complexe phonique" whose articulation marked "la rupture du lien organique avec les substantifs en -ιδ- ou en -ιγ-"; this was then "isolé par une fausse coupe." At first, Latin could not render it; Old Latin used *-isso*, which was not satisfactory since the sound was "une sourde." Classical Latin integrated it as *-izo*. Finally, Vulgar

Latin assimilated it when assibilation of dentals before *yod* had taken place, and it was also commonly spelled *-idio*. This account may unnecessarily complicate matters: Latin also had difficulties in noting palatal and hushing sounds and tried with various letters, including Z finally, which became equivalent to DI + vowel when palatalization had been completed, and affrication started.

[17] In *Donati Artem maiorem*, p. 225.

[18] *De Orthographia*, p. 51.

[19] *Commentarius in Artem Donati*, p. 423. Zacynthos = ʽΤακινθοσ reveals two things: Old Greek /y/ is now [i], or [j] in consonantal position, and it has affricated. (The *y* of the Latin orthography is misplaced, but kept; this seems to be the same type of misspelling as Lybia for Libya, for instance.) The ζ = υ + vowel alternation, according to Passy, might reflect that ζ is a palatal (cf. above, note 16).

[20] That is, palatalization occurs for velars before [i]. /ti/ could only be [ti], since it is [ti] in all Romance languages today (except in the recent development of Rumanian, Romantsch, Brazilian, and some French dialects, including Creoles and Canadian French): *dire*, *dimanche*, *tirer*, *timon*, *partir*, etc. On the other hand it is little surprising that the peculiar (hushing) quality of the palatalized velar in *[cçi] or *[cši] should be heard as belonging to the /i/; linguistically this is what causes it. This misinterpretation is attested for Canadian French today. Two Canadian informants from

Quebec assured the author that [y] and [i] had a different sound after [t] and [d] and after other consonants, whereas in France [y] and [i] were "lighter" in all environments. In effect, dentals assibilate before [i] and [y] in French Canada (cf. above, 1.4-1.7), so that /ti/ is [t^si] as against /ki/ = [k'i]. Only the consonant is altered, but if any notice is taken by a non-specialist, he is more likely to hear it as an alteration of the vowel than of the consonant. This interpretation seems confirmed by Pompeius, *Commentum Artis Donati*, p. 104: "unus, ecce u tenuiter sonat. iunge illam ad aliam litteram, et vide quia non sic sonat, sed pinguius sonat, vulnus vanus. numquid sic sonat unus, quando u sola est? non. sed tenuiter sonat. vanus quando dico, pinguior sonus est. numquid dicis u a nus? ergo vides quia, si ponantur solae tenuem sonum habent, si iungantur ad alias litteras, pingues sonant. similiter est i sic patitur. itur, ecce tenuius sonat; si dicas Titius, pinguius sonat...." Clearly, the affrication is heard as a special quality of the *vowel*.

[21] This is confirmed by many Modern Greek dialects, which have [ts] for /t/ before [i]. The letter used by Consentius is *z graecum* though, which might indicate that the Greeks, at the time, palatalized dentals before high front vowels, as do Brazilians. If this is true, then, OPTIMVS must have gone through the stage currently attested in Brazil, [cš], before continuing to the [ts] attested in Modern Greek. It appears more probable, however, that Consentius says *z graecum*—a learned pun—because he knows this letter to be *peregrina* from Greece and notes precisely that the Greeks pronounce [ts] where they should pronounce [t].

(As has been suggested in 3.4, learned puns, mnemotechnical approximations and allusions are not foreign to Latin grammarians; their written grammars are intended to be inseparable from their oral teaching, and thus to the immediate memorization of students. A comparable statement to that made by Papirius--see below, 3.9--found in Isidorus of Seville, *Origines*, I, 27-28, reveals more concern with orthography than with pronunciation: "Y et Z litteris sola graeca nomina scribuntur. nam cum 'iustitia' sonum Z litterae exprimat, tamen quia Latinum est, per T scribendum est.") Mirambel has shown, in his paper to the *Société de Linguistique* (see *BSL* 38 [1937], xv-xvii), that the Greek *koinê* underwent assibilation of dentals before [i] as early as in the second and third centuries A.D. (Also see his "Le Groupe *ts* en grec moderne.") Thus fourth or fifth century Greeks must have had a tendency to affricate or "infringere" in Latin in the same manner, "ubi non debent," hence *['optsimus]. This in turn explains Consentius's remarks, and the erroneously understood statement to the effect that /i/ has an affricate or "infrictus" allophone after /k/, but not after /t/. In short, in Greek /ki/ = [cçi] and /ti/ = [tsi]; but in Latin /ki/ = [cçi], [cṡi] or [ṭʃi], while /ti/ is [ti].

[22] See *Commentum Artis Donati*, p. 81. After having distinguished between *vox articulata* and *vox confusa*, Donatus immediately states that a letter (= a phoneme?) is the smallest unit of an articulate syntagm; but Pompeius explains: "nam vox est quicquid locquimur, ut puta si dicas 'orator venit et docuit'. potest tamen et solvi, orator, venit, et, docuit: ecce solvisti orationem in verba. potes ipsa

verba solvere in syllabas o et ra; potes ipsam syllabam solvere in litteras. numquid potes ipsam litteram solvere ulterius? nequaquam potes. ergo propter has res quas dixi omnes vide et definitionem Donati, 'littera quid est? pars minima vocis articulatae.'"

[23] On the other hand, Pompeius was certainly more a phonetician than a phonologist or a linguist, as Donatus was. Donatus, for example, discusses Greek F and Latin V and concludes that they are not the same "sonus," since whether you put a F or not in *Velenus* or *Elenus* makes no difference in Aeolian (where apparently the digamma was still often heard) whereas in Latin you could not say *serus* = *servus* or *ulgus* = *vulgus*, etc. interchangeably. Pompeius cannot agree with this view since he has personally observed that Latin V before vowel "idem sonus est" as Greek F; in fact V, to him, "vere digammus est" (*Commentum*, p. 105). But, perhaps for that reason, Pompeius makes more accurate phonetic observations than other Latin grammarians.

[24] Pompeius's use of the word *medius* is entirely new. Before him, /i/ and /u/ had a *medium* articulation in V*I*R, OPT*I*MVS, MAX*I*MVS, ZEPH*Y*RVS.

[25] In English, if one says 'yet' [iɛt] instead of [jɛt], or in French 'hier' [iɛːʁ] instead of [jɛːʁ], it hardly sounds strange. The reason for this may be that in the three languages, Latin, English and French, the vowel and the semivowel tend to be (or are) variants of the same phoneme, or archiphoneme.

[26] See Karl Mras, "Assibilierung," p. 89. Examining Pompeius's observations he writes "... *media illa syllaba mutatur in sibilum,*

denen zufolge also nicht der Laut des t, sondern die ganze Silbe ti assibiliert wird, ich so auffasse, dass er nicht die Aussprache Titzius, sondern Titzus meint." Mras considers assibilation of dentals well attested by Latin grammarians, but not palatalization of velars (pp. 80-90). However, he observes the merger of /k/ and /t/ before yod in the second century, and conjectures that the actualization of this archiphoneme was "ohne sibilus" (p. 90). There seems to be two contradictions here: an assibilation without a sibilus, for /tj/, is hard to understand, and if /kj/ = /tj/ there must have been a palatalization, at least of the former.

[27] See Charles-Théodore Gossen, "L'Interprétation des graphèmes et la phonétique historique de la langue française." The graphemes of ancient French texts are not phonemes, or sounds, but old conventions.

[28] "La Phonologie actuelle," p. 241, note 3. Also see Wang, "The Chinese Language," p. 60 (see above, Chapter Two, note 44). The interpretation is based on comparisons with other systems, in the light of phonological likelihood.

[29] "Review of A. Graur, I et V en latin," p. 101.

[30] Le Système consonantique du breton, pp. 29-30. For example, in modern scholarship, the voiceless palatal occlusive has been symbolized as "t'," "ţ," "k_y," "t^y," "ɟ," "ty," "c"; the hushing affricate as "č," "tsh," "ć," "ts,"ʃ̂," "tʃ"; some German scholars have used "dsch" for [dʒ].

[31] "Certaines graphies populaires transcrivent par *ti* ou *di* un *k* ou un *g* mouillés. De *pitietta* pour *piketa* ..., on rapprochera *pitier men* pour *piker mein*, 'tailleur de pierre' ... et un mot trégorrois, *fatitian* ... pour *fatikan* 'tomber en faiblesse'. Une écolière de Châteauneuf-du-Faou écrivait *diouenne* ce qu'elle devait prononcer (ɟyɛn:) 'blanc'" (*loc. cit.*).

[32] P. Dorveaux, "Ancien provençal NOTZ YSSERCA, NOT YCHERCA, etc." pp. 241-243, shows that a sound which was /ʃ/ originally was noted by six different graphemes.

[33] Where did Nyrop, *Grammaire historique*, I, 447, find his forms: "On trouve dans les textes bas-latins et les inscriptions: Titsius, Acuzius, Tezianus, et osiosus, observasione, etc."?

[34] Found in O. Hirschfeld and Carolus Zangemeister, *Corpus Inscriptionum Latinarum*, by R.A. Haadsma and J. Nuchelmans, *Précis de latin vulgaire*, p. 30.

[35] *La pronuncia del latino nelle scuole dall'antichità al rinascimento*, p. 119.

[36] "TS en latin," pp. 265-266.

[37] Around the time of the Carolingian Renaissance, the clerks of all Europe used the "z" with the value [ts] or [dz]: hence French *chez*, *avez*, *lez*; Italian *prezzo*, *mezzo*; Spanish *razon*, *vez*; German *zehn*, *zug*, etc. But that does not imply that ζ had the same value in (Old) Greek and in Vulgar Latin. After all, ζ has become [z] in Modern

Greek and in French, and [θ] in Castilian. This must not be taken as evidence that it was either in Old Greek or in Latin. Graur's argument seems not to take into account Trubetzkoy's warning against direct graphemic identification.

[38] "Palatalizzazioni osche e latine," pp. 116-118.

[39] *La Phonétique des inscriptions latines de la Gaule*, pp. 71-73.

[40] *Le Latin de Grégoire de Tours*, p. 172.

[41] *Renseignements archéologiques sur la transformation du C guttural du latin en une sifflante*, quoted by Pirson, *La Phonétique*, p. 73.

[42] Pirson, *La Phonétique*, p. 73; Alessio, *Grammatica storica francese*, I, p. 192. In his review of the latter, Martinet reasons that if OFIKINA = [ɔfi'kina] in the sixth century, it should be **uchine*, like *échine* (< Germ. *skina*), not *usine*. He concludes: "For all we know, -k- in that word may have stood for [d'] or [dz'] ..." (p. 175).

[43] "Aspects de la différenciation territoriale du latin sous l'empire."

[44] Pirson discovers a CHINGXIT for CINGIT (*ibid.*, p. 73) in 676 A.D. This strange spelling is perhaps not so much an archaism, as PVLCER for PVLCHER, BACCIS for BACCHI or SVMACI for SYMMACHI (*loc. cit.*), for example, appear to be, as an oddity that seems learned. Merovingian letters are similarly complicated and difficult to read. It seems plausible that "k" in OFIKINA, PAKE, etc. is an erroneous archaism as "d" in *poids*, "g" in *legs* or "k" in Brunswick, Leipsick. An archaic spelling, however, does not automatically imply that there

is no archaism in pronunciation any more than it means that there is one. Each case must be interpreted separately.

[45] "Chanter" is [ʃã'te] in Corneille's time. It does not imply that this was its pronunciation in the 12th century. Similarly, in Charlemagne's days, "c" (before "i, e," in Ile-de-France) and "z" probably had the value [ts] or [dz]. Why should this value not be a development from another usage?

[46] Old Greek has a special letter to indicate the sound rendered in Classical times by σσ, ττ etc. (See Grammont, *Phonétique du grec ancien*, p. 107). Its value might have been that of a palatal consonant, i.e., the value of κ before /i, e/ today.

[47] See Mirambel, "Du Caractère des chuintantes," p. 77.

[48] See Migliorini, "L'intacco della velare," p. 286, and Meyer-Lübke, "Ngr.-έρι = Vulglat.-eriu - kl. Lat.-ariu?," p. 2.

[49] "Le Groupe *ts* en grec moderne," p. 93. Also see Migliorini, "L'intacco della velare" p. 287.

[50] Similarly, Aldo Rossellini's position may appear unfounded: "Le testimonianze dei grammatici latini e delle iscrizioni ci avvertono che la *dy* era pronnunciata [sic] [dʒ]" (*Trattado di fonetica storica dell'italiano*, p. 127). But a hushing stage in the development of Vulgar Latin palatals appears plausible.

[51] Many dialects have palatalized, and have hushes and hisses today. Standard Greek has palatal occlusives for κι, κε. While it is improbable that this pronunciation was *restored*, it is possible that

it has been retained for a long time. Possibly, Vulgar Latin and the Greek *koinê* had palatal allophones of velar phonemes before high front vowels, but these affricated quickly and continued to evolve from this point in the Western part of the Empire, whereas they stayed basically unchanged in the Eastern part, and throughout the modern times up to the present, at least in Standard Greek; they affricated in most Neo-Greek dialects.

[52] See Cantineau, "Essai d'une phonologie de l'hébreu biblique," pp. 88-122.

[53] Migliorini, "L'intacco della velare," pp. 281-288. The often quoted Germanic form *zins* (<*tins < CENSVS) is probably not reliable. If it were a popular form, CENSVS would have resulted in *CESVS before being borrowed, as -NS- > -s- in a phenomenon dating from early Vulgar Latin (cf. above 3.3). See Mohl, "Review of Meyer-Lübke, *Einführung*," p. 595.

[54] Petar Skok, "Zur Chronologie der Palatalisierung von *c g qu gu* vor *e i y i̯* im Balkanlatein," p. 386.

[55] "Wörter mit *S-/Z-, TŠ* im Romanischen, Baskischen und andern Sprachen," pp. 404-416.

[56] "Zur Palatalisierung des lat. *C*," p. 495.

[57] The argument here is that assibilation of CI, CE must have been completed by the time of the Germanic invasions, otherwise Rikhild would undergo it as well and would be **Risseut*, not *Richeut*. Implicit here is the hissing channel of Lenz.

[58] According to Theodor Frings and Walther von Wartburg, "Germanisch-Romanisches. Französisch-Fränkisches," pp. 86-97. In the view of the authors, **skakjo* is Modern English *shake*. Marchot (*Petite phonétique*, II) gives the following forms: 1) in (t + j), **hatio(ne)* > *haz*, **brustja* > *brosse*, **hulstja* > *housse*, **krostjat* > *croisse*, **bultjone bozon*; in (k + j), **skankjone* > *échançon*, **skankjare* > *échancier*, **warkjone* > *garçon*, *skakja* > *échasse*, *makjone* > *maçon* (pp. 54-55).

[59] It may be counterargued that *cherries*, *camp*, etc. are not only Norman or Picard forms, but Proto-Francien forms as well. This is impossible to prove. *City*, *chimney*, *channel*, *chalk*, *cheese*, etc. appear popular and Francien, but they merely counterweigh the "Norman" series.

[60] "Two Anglo-French Etymologies," pp. 269-272.

[61] The Old French forms related to these are: "*broissier* > *brush*; *froissier* > *frush*; *laisse* > *leash*; *caisse* > *cash*; *boissel* > *bushel*; *croissir* > *crush*; *huissier* > *usher*; *moisseron* > *mush(room)*" (*ibid.*, p. 270). There is a similar alternation with French and Walloon (see below, 4.6-4.11).

[62] Personal observation; from *CERESEA. But how about the *final* [ʃ]?

[63] *Chronologische Phonetik*, p. 82.

[64] "Observations sur la chronologie et les dates de quelques modifications phonétiques en roman et en français prélittéraire," p. 302.

[65] For Bourciez, *Précis historique*, p. 116, it seems that "cette altération du *C* latin paraît s'être généralisée vers la fin du IIe siècle..."; [t + j] had a "son sifflant... dès le IIe siècle" (p. 146). Modern textbooks have similar chronologies: [tj] is [tsj] when CRESCENTSIANVS is written, but it does not lose its palatal quality till the seventh or eighth century. Various intermediary steps: [tsj] > [ts'] > [ts] etc. provide for a smooth transition.

[66] "Die Aussprache des *c* und *t* im klassischen Latein," p. 62.

[67] Compare this opinion with Vendryes's remark on: "... le comparatiste, naturellement enclin à reculer dans le lointain de la préhistoire les traits communs qu'il observe à date historique. [...] En fait la question est souvent insoluble, et il faut avouer qu'en dehors des historiens qui attachent un prix particulier à la trancher, elle n'a souvent pour les linguistes qu'un intérêt secondaire" ("La Comparaison en linguistique," p. 4).

[68] Latin "L" had a labio-velarized actualization in syllable final position: [ɫ], as in English (or Dutch, Catalan, etc.) *bull*, *belt*, *gold*, *pill*.

[69] See Meillet and Vendryes, *Traité de grammaire comparée*, p. 111.

[70] "Review of M. Leumann and J.B. Hofmann, 5th ed. of Stolz-Schmalz, *Lateinische Grammatik*," p. 69; emphasis added.

[71] "Review of Campus, 'Le velari latine,'" p. 222; emphasis added.

[72] A reaction of conservation may lead to hypercorrection.

[73] "Review of J. Bröndum-Nielsen, Dialekter og dialektforskning," p. 185. Explicitly referring to Meillet and Vendryes, Sommerfelt states: "La prononciation [k', g'] est cependant établie dès l'époque préhistorique du latin." Straka's [t'] in "Observations," pp. 304-305, is not explained; in "Naissance et disparition des consonnes palatales," p. 118, on the contrary, he affirms: "Quant au latin, il y a lieu de souligner le fait important qu'à l'exception du y, il ignorait les palatales."

[74] Introduction à la chronologie du latin vulgaire, pp. 306-307.

[75] Oscan and Umbrian are the Italic dialects spoken by Rome's most dangerous enemies till the second century B.C., the mountaineers of Central and South-Central Italy, from Perugia (Umbrian) to Naples (Oscan), by and large the regions that still have a [tʃ] in the modern Italian dialects.

[76] The retention of the aspirate H and of the diphthong AV seems to have been an important stumbling block for an educated pronunciation. The latter point is particularly revealing. While it undoubtedly appears (because of CLODIVS for CLAVDIVS) that the Roman plebs had already an [O] allophone of /au/ by Cicero's time, it is also clear that [au] was still a possible actualization at least four centuries afterwards in Northern Gaul, as shown by the palatalization of French chose < CAVSA, similar to Charles < Germ. Karl. This seems to indicate a sharp and stable socio-linguistic cleavage.

[77] Robert Cameron, personal communication, November 1972.

[78] "Notes," pp. 28-29.

[79] *Etude*, p. 207.

[80] The discrepancy is accounted for in phonetic terms by Grammont, apparently approved by Pope, *From Latin to Modern French*, p. 125: [g] is usually articulated slightly farther back than [k]. A description, however, can hardly be considered an explanation. Besides, recent palatograms and radio-films do not show this at all. In fact, Haden, *The Physiology of French Consonant Changes*, pp. 80-87, has shown that in Modern French at least, [g] is more palatal than [k]. Haden's observations, however, may not be conclusive as he examines two informants only.

[81] See Duraffour, "Phénomènes," pp. 220-259. In the regional French of Wallonia, *clappier*, *papier*, etc. can be heard as [klapçe, papçe] = [klapśe, papśe], and in French Canada *pièce*, *piastre*, etc. are often rendered as [pśɛs, pśæs].

[82] "Correlation and Core-Relation in Diachronic Romance Phonology," p. 95.

[83] Dorfman, personal communication, suggests: "I see *eskina* as *esćina*, with /s + ć/ developing later as /č/." This view may be weakened by the observation that Germanic /k/ (preceded *or not* by /s/) seems to give /ʃ/ (cf. above, 2.2 and 3.25).

[84] See "Review of G. Alessio, *Grammatica storica francese* " p. 176.

[85] "*C* et *G* suivis d'*A* en provençal," pp. 537-538.

[86] "Die Mundart des Leodegarsliedes," p. 295. Suchier presents and discusses the opinions of Lüking and Paris (*ibid*., pp. 294-295).

[87] The reason for the retention of [j] in *chier*, as against its loss in *cher* seems to be the pressure of the paradigm, as an analogical shift of stress gives forms with a stressed [i].

[88] "Palatalisation et diphtongaison en roman et en slave," p. 140.

[89] [cš] has *yod*-transitions on both sides; a narrow phonetic notation would give [^{j}cš^{j}]; [ṭʃ], normally noted [tʃ], as an apico-prepalatal articulation, does not have any.

[90] If this is true, it is oversimplified to describe the Picard process as a regression. When followed by a *free* /a/, which had become [ɛ] at the time, the palatalized consonant did not evolve as before *checked* /a/: k > *k' > k, CARRV > *car*, but disengaged a postconsonantal *yod*: k > *k' > kj, CARV > *quier*, CAPRA > *quièvre*.

[91] "Observations," p. 285; Straka discusses these dates (pp. 248-305).

[92] "Zum Uebergang von intervokalischen *t* zum *d* im Vulgärlatein," pp. 731-732.

[93] Jeanneret, *La Langue des tablettes d'exécration latines*, quoted and discussed by Jud, "Review of Jeanneret, *La Langue des tablettes*," pp. 549-552.

[94] *Der Vokalismus des Vulgärlateins*, I, 125-129.

[95] *La Fragmentation linguistique de la Romania*, p. 34.

[96] The second lenition does not affect fricatives. Thus it may be hypothesized that *[c] was already *[cš] or [tʃ], if not [tṣ] or [ts] (see the discussion below, 4.4).

[97] "Pour la chronologie des modifications phonétiques," p. 498. This Burgundian chart is dated 906.

[98] Vulgar Latin also sonorized consonants followed by the "liquids" [r] and [l], and regardless of stress: FRATRE > *frère*, CAPRA > *chèvre*, Spanish POPVLV > *pueblo*; OP(E)RARE > *ouvrer*, APERIRE + OPEN > *ouvrir*. Another difference from the current American sonorization is the fact that while this applies to [nt] and [nd], Gallo-Romance has VERECVNDIA > *vergogne*, BVRGVNDIA > *Bourgogne*, but ROTVNDA > *ronde* as CVM(PV)TARE > *conter*, COMITE > *comte*, CANTAT > *chante*.

[99] Simultaneously though, in monasteries, learned Church Latin started to develop from Carolingian reforms. It was not long until this "revived" Latin introduced thousands of forms unavailable from the probably limited resources of early Francien, whence the abundance of apparently little related doublets in the following period: *meür* = *maturité*, *seür* = *sécurité*, etc.

[100] Agreement has been reached today on the chronology of Old French deaffrication: [ts, tʃ, initial dʒ] became [s, ʃ, ʒ] in the standard pronunciation of Francien during the 13th century. Richter suggests the eighth century for the [dz > z] change (in effect [jdzj > jz]; see *Chronologische Phonetik*, p. 82). Other clusters, Latin STI, SCI + vowel, SCI, SCE, X, are discussed in 4.12-4.14: their evolutions

seem linked with *parasitic i* and channels of development. The loss of occlusion in these seems to be an early phenonemon. It appears to have been completed as early as in the fifth century; one finds DISSESIT for DISCESSIT, SVSSITABIT for SVSCITABIT or SVSCITAVIT (see Alarcos-Llorach, *Fonología española*, pp. 235-236).

CHAPTER FOUR: THE ECONOMY OF PALATALIZATION

4.1 The four essential developments in the Gallo-Romance palatalizations outlined above are envisaged here from a functional viewpoint i.e., from a viewpoint that attempts to combine structural dialectology and diachronic phonology. Speech-sounds form a pattern of oppositions defined by their features.[1] A functional-structural study thus attempts to apprehend the economy of one or several changes within the network of relationships constituted by the features of the units. The functional-structural theory's concepts, terms and procedures used for this investigation are those described by Martinet in Economie des changements phonétiques.[2] In this chapter the functional-structural principle of linguistic economy constitutes the framework of the discussion. The diverging evolutions of Langue d'Oïl dialects are considered in the light of the impact, on their systems, of the various "choices" made at a previous stage. Dialectology is apprehended from the viewpoint and with the methods of diachronic phonology. According to Diego Catalán, this type of study may eventually absorb all other techniques of historical linguistics, and a "structural history of languages" [3] must stem from it.

Palatalization and Affrication of Dentals + Yod, Velars + I, E, AE.

4.2 Observations made from a phonetic viewpoint (cf. Chapter Two, notes 38-42) seem to point to the regularity and the naturalness of the hushing channel of palatalization. This preliminary observation may be integrated in the functional framework as "phonologically likely" in general. It has been seen (Chapter Two, note 40) that Chomsky and Halle have integrated this "substantive universal" into the generative framework. The hushing affrication of a consonant + *yod* (or *yod* alone) may be considered as an economical development in general since the hush seems to be an economical integration of a paradigmatic reality (a *yod*-transition) into the syntagmatic one (in consonantal or postconsonantal position). It appears syntagmatically simple to actualize /consonant + j/ as a hushing affricate. This observation may be considered valid for all languages. According to functional-structuralism, *each* linguistic system is supposed to contain pressures of its own, which depend on the internal balance or unbalance attained by the structure at a given point. Latin had no palatal or hushing phonemes. The appearance of a palatal or hushing order would thus fill an empty phonological (*structural*) space and cause no *functional* difficulty, since it would involve no phonemic mergers. If the notion of a structural hole is contested, or the existence of such a hole in the palatal area of Latin, the functional tolerance of the Latin consonantal system to a palatal or hushing development may nevertheless be considered maximal.[4] The hushing channel may thus appear a little more plausible in Romance. If it is assumed, hypothetically, that the hushing development took place in Vulgar Latin, the hush may at first be envisioned as a phonetic characteristic linguistically non-existant (as a phonemic feature) until it may be opposed to "non hush" in a distinct phoneme. The phonemicization of the hush might have occurred relatively early. If [cš] and [ǰš] may be considered allophones of /tj/, /k + j, i, e/ and /j/, /dj/, /g + j, i, e/ respectively since there is no /t + s/ or /d + z/ sequence in the language to which they could be opposed, this is not the case with [ś] and [ź]. The fricative consonants of *BASIARE [ba'śare] or [ba'źare] and RASARE [ra'sare] or [ra'zare] may have been opposed as /ʃ/ to a /s/ and not as /s + j/.[5] This problem of [ʃ] as /ʃ/ or /s + j/ in Walloon is studied by Léon Warnant. His conclusion is that /ʃ/ exists in the patois of Oreye (Liegeois Walloon): [ʃɛrˋfu, ʃɛrˋpɛ̃ː] are /ʃErfu, ʃErpẼ/ because [ʃ] is no longer actualized as [sj] under any circumstances, and because borrowings from French contain a /ʃ/ that cannot be considered /s + j/.[6] The difference with Vulgar Latin is that here it is not known when the [sj] variant disappeared, and it might have been long after the first actualization in [ś]. Even less verifiable is the borrowing or the spontaneous creation of words with [ś] without a [sj] variant. At any rate, if /ʃ/ exists in Vulgar Latin, by correlation [tʃ] and [dʒ] may have to be regarded as /tʃ/ and /dʒ/, even if there is no /ts/ and /dz/ yet, since there is a /s/.

Palatalization and Affrication of Yod, Labials + Yod, Velars + A

4.3 It seems that yod developed in the same way as the palatal clusters mentioned in the preceeding paragraph. Its remaining hushing in word-initial position, as do all voiced clusters in syllable-initial position, is discussed in 4.17. If the Vulgar Latin palatals were hushing at the time of the second palatalization (labials + yod, remaining velars before front vowels, i.e., before hereditary [a] and, in words borrowed from Germanic dialects, before [i, e, a]) only one of these two alternatives could develop, if the new palatals tended to follow the hushing channel of development. Either they all merge in hushes, or the old hushes move forward and avoid merger with the new palatals, which tend to become hushing themselves. This second hypothesis relies on the idea of a *chain*,[7] and was perhaps envisaged by Schuchardt, Dauzat and Passy (cf. above, 2.2-2.9). It was not, however, explicitly advanced until Haudricourt and Juilland described it with a theoretical apparatus that rendered it unambiguously definable (cf. *Essai*, pp. 91-94). These authors insist on the fact that there must have been *two* chains in Francien. The first chain differentiated, in hisses, the reflexes of VL dentals *+ yod* from the hushing actualizations of velars *+ j, i, e*.[8] The second chain merged all these in hisses when the new palatalizations developed, whose reflexes are still hushes today (*ibid*., p. 84). Spence, "The Palatalization," p. 26, describes the first of these two chains as "unreal" since the functional yield of the opposition /tj/ vs /kj/ was low: "An admittedly rather cursory search for minimal pairs failed to reveal any" (p. 26, note 2). It seems also that the Latin inscriptions reveal the confusion of /tj/ ≈ /kj/ and /dj/ ≈ /gj/ (cf. above, 3.2 and 3.15). As for the second chain, Spence sees it as pull chain. The Vulgar Latin palatals, which he calls an "unstable primary group" (p. 35)—presumably [c] or [ɟ] (cf. above, 2.15)—were not yet hushing or hissing in Langue d'Oïl Romance when the new palatalization occurred. Proto-Francien finally rendered as hisses the "unstable primary group," while Proto-Norman-Picard rendered it as hushes. Thus, in order to avoid merger, the new palatals could become, in Proto-Francien, hushes, or stay (or regress to velars and labials + yod). In Proto-Norman-Picard they "could either differentiate to [ts] or remain (or be restored to) k" (p. 36). Schematically, Spence's pull chain is:

fig. 1: Norman-Picard vs Francien (Spence)

t + j ⎫ > ts (Francien)
⎬> c
k + j, i, e ⎭ > tʃ (Norman-Picard)
> tʃ (Francien)
k + a > k (or k') > c
> k (Norman-Picard)

Why k + a did not differentiate in [ts] in Norman-Picard rather than be restored to k is not explained if one accepts, with Spence, that [c > ts] is as normal as [c > tʃ]. But if one does not accept this view and on the contrary accepts the regularity of the hushing channel, the following scheme--basically Haudricourt and Juilland's second chain--may appear plausible:

fig. 2: Norman-Picard vs Francien (Haudricourt and Juilland)

In Syllable Initial Position	Latin	Gallo-Romance	Norman-Picard	Francien
t, k + j	c	cś	tʃ	ts
d, g + j	ɟ	ɟź	dʒ	dʒ
k, + i, e	c	cś	tʃ	ts
g, + i, e	ɟ	ɟź	dʒ	dʒ
p + j	pj	pś	tʃ	tʃ
b, v, m + j	j	ź	dʒ	dʒ
k + a; Germ. ——	k + i, e	c	k	tʃ
g + a; Germ. ——	g + i, e	ɟ	g	dʒ

It would have rendered this chart too complicated to include in it the Latin fricative /s/ and the "heavy clusters," as well as the reflexes in intervocalic position, where Norman-Picard has unexpected hisses. These processes also involve sonorization and disengagement of parasitic i, and are consequently discussed below (see 4.5-4.11) Examples of the first chain are:

	Norman-Picard	Francien
MARTIV	march	mars
HORDEV	orge	orge
CAELV	chiel	ciel
GELV	gel	gel
REPROPIAT	reproche	reproche
SIMIV	singe	singe
CARRV	car	char
GAMBA	gambe	jambe

Sonorization and Lenitions

4.4 Intervocalic consonants lenited in Western Romance. Voiced consonants became spirant, voiceless ones sonorized, and geminates simplified. Then, in Langue d'Oïl Romance, intervocalic voiced occlusives also became spirant, and many (cf. above, 3.35-3.36) lenited out without leaving a trace. Clusters, except two-consonantal ones ending with a liquid (FRATRE > *frère*, POPVLV > Sp. *pueblo*), did not lenite. Palatal occlusives are probably to be considered regular occlusives, but their linguistic status and behaviour may be modified once they have affricated. They may then join the category of clusters. Something partly similar may be observable in American English. Intervocalic dentals sonorize after stress. Those in *nature*, *stature*, *signature* etc., however, do not. Their affricated actualization perhaps explains this.

SIGILLV and BAPTIDIARE give *seau*, *bateier* in Old French, BACA and PAGANV give *baie*, *païen* while SECVRV gives *sûr*. RATIONE and RACEMV give *raison*, *raisin*, not **rayon*, *rayen*. A first solution thus consists in having the first lenition, followed by the simplification of geminates, occur before affrication. The late Vulgar Latin forms of these test-words would then be *[se'jelu, bate'jare], *[baga, pa'janu], *[se'guru], *[ra'ɟone, ra'ɟemu] before affrication. The difficulty of this solution is the attested spellings in "Z" in intervocalic position. On the other hand, such forms as EO, TRIENTA, VINTI, MAESTER, for EGO, TRIGINTA, VIGINTI, MAGISTER, may not support it conclusively, since, according to Meillet, they "prouvent plus pour des traitements de mots accessoires, peu surprenants dans ces mots; que pour une altération de gutturales prépalatales."[9] But they may also be considered as "straws in the wind," or privileged forerunners (of a by and large later development), since they seem to indicate a channel of evolution which will eventually be followed by the whole lexicon.[10] It was thus possible that sonorization and lenition preceded affrication, in spite of some contrary evidence, namely the Z and DI + vowel spellings attested near the end of the Empire. These possibly reflect an upper class usage. This hypothesis, however, does not appear structurally necessary. In fact, since CL -S- and -SS- become respectively /z/ and /s/ in Gallo-Romance, a second solution may be imagined, whereby sonorization and lenition processes occur between the first (Vulgar Latin) and the second (Gallo-Romance) affrication. This gives the hypothetical forms *[se'ɟžellu, batte'ɟžare], *['baka, pa'ganu], *[se'kuru], *[ra'cšone, ra'cšemu] before the first sonorization-lenition processes, which afterwards become *[sejelu, bate'jare], *[baga, pa'janu], *[se'guru], *[ra'ɟžone, ra'ɟžemu]. This solution appears more satisfying to the extent that it seems to parallel Italian results, these being comparable to the hypothetical forms at either one of the reconstructed stages. But, if the change [cš] > [ɟz'] appears also plausible in view of the fact that [s] > [z], as just suggested,[11] the change [ɟž] > [j] is unexpected, though not unknown. Durand, "La Palatalisation des consonnes," explains that English *yield*, *yell* etc. are supposed to have had a [dʒ-] stage (p. 176). But it seems to be rare. Martinet, "Review of G. Alessio, *Grammatica*," suggests that the Gallo-Romance lenition took place before the Gallo-Romance affrication of palatals, but does not specify whether the Vulgar Latin lenition took place before or after the Vulgar Latin affrication (p. 176). It is not clear whether Martinet implies that the [jz] in *plaisir* could only derive from a voiced occlusive stage. Between the two possibilities outlined above, it seems arbitrary to choose. Yet there may be some phonological evidence to support the first solution: that which makes Vulgar Latin sonorization precede Vulgar Latin affrication of palatals. This evidence is the distribution of *parasitic i*.

The Economy of Sonorization vis-à-vis Parasitic i

4.5 The key to Proto-Francien palatalizations seems to lie in the distribution of *yod*-transitions before the palatal cluster. French has retained it in *raison*, *raisin*, *angoisse*, *poisson*, *palais*, *paix*, *cuisse*, etc. from RATIONE, RACEMV, ANGUSTIA, PISCIONE, PALATIV, PACE, COXA. It has eliminated it in *masse*, *face*, *vache*, *goujon*, etc. from MATTEA, FACIA, VACCA, GOBIONE.[12] There probably never was a *parasitic i* before the palatalized labials. Their evolution may be different in this respect because the labial occlusion was probably retained throughout the strengthening of the *yod* in [ʃ] or [ʒ]. It is only at that point, in general, that it is abruptly replaced by a homorganic retroflex alveolar [ṭ] or [ḍ] which has no *yod*-transitions. On the contrary, the palatalization of *velars + a* seems to have been a real palatalization insofar as it was the [c, ɟ] stage which probably conditioned the subsequent affrication. These palatal sounds have the clearest possible yod-transitions. The clusters of MATTEA and FACIA, and later VACCA, are homorganic with the clusters that disengage a parasitic i. It is suggested that it is, for these forms, the abrupt onset of their voiceless occlusives which best explains the absence of a parasitic i (cf. Chapter Two, note 41). This reasoning, by means of which VL [ɗ] or [ɗž], [šš], [š], [ž], [šc] or [šcš] disengage a yod, whereas only [c] or [cš] does not, implies a relative chronology whereby sonorization precedes disengagement of yod, since RATIONE > raison, not *razon, RACEMV > raisin, not *razin, etc. If this is true, the first solution proposed in the preceding paragraph receives support, and the distribution of parasitic i in French is accounted for in a satisfactory manner from a phonological viewpoint. RATIONE, RACEMV first sonorize; their palatals thus disengage a yod. In the same way PALATIV, CRVCE, which unvoiced their final consonants in Early Old French [palajts, krojts], sonorized in the same fashion:

				(Old French)
RATIONE	*ra'ɗ(ž)one	*raj'ɗžon^{ə}	*raj'dzõn	raison
PALATIV	*pa'laɗ(ž)^{u}	*pa'lajɗž^{ə}	*pa'lajts	palais

However, MATTEA, FACIA (and VACCA) did not sonorize. It is difficult to know if simplification of geminates preceded affrication or not. The channel may be illustrated as:

MATTEA	*'mac(cš)a	*'macša	*'mats^{ə}	masse
FACIA	*'fac(cš)a	*'facša	*'fats^{ə}	face

The Economy of Parasitic i vis-à-vis Depalatalization

4.6 *Parasitic i*, in turn, may provide the basis of a phonological hypothesis concerning the dialectal variations -js-/-jz- vs -ʃ-/-ʒ- in Francien on the one hand, Walloon and Lorrain dialects on the other. Modern Walloon has hushing reflexes as a primary result of those palatalizations which give *parasitic i* + hisses in French. (In a process similar to the /dʒ/ > /ʒ/ > /ʃ/ > /x/ of Renaissance Castillian, Liegeois dialects further developed these hushes into "secondary H's.") Remacle's first "provisional" hypothesis for Gallo-Romance Liegeois is the channel s + j > *ʃ > ç > h; z + j > *ʒ > ç sonore > h.[13] But after discussing the many forms which give *[ʃ], [ʒ] in Old Walloon, he proposes the channel (p. 232): (t + j) > tsj > dzj > jdzɟ > jzj > jz > ʒ (> ç sonore > h). Remacle thus does not agree with Marchot, who sees in [sj] the necessary antecedent of [ʃ] and shifts the *yod* backwards after having shifted the [k] in the other direction (*Petite phonétique*, II, 71). Remacle describes this as a "réjouissant aller-retour, qu'on saisira sur le vif dans l'exemple suivant: vascellu > *vacs-* > *vajs-* > *vasj-* > w[allon] [va'ʃɛ:]" (p. 210). Marchot's idea seems dubious to the extent that the process appears too complicated. However if it is dangerous to claim that [sj] is the necessary antecedent of [ʃ], it is observable that [sj] is a more common antecedent of [ʃ] than [js] is. Marchot's channel is difficult to accept because of its movements back and forth, where the *yod*, in its different stages of development, jumps about the so-called "palatalized" consonant without palatalizing it until the final *[sj]

> *[ʃ] development. These complicated movements seem in effect all the less probable since the [ʃ] and [ʒ] of Walloon seem to have developed at a very early stage. Remacle observes that they must have been there when Old French /ɛi/ became [ɔɩ],[14] i.e., "before the middle of the twelfth century" (Pope, *From Latin*, p. 104).

4.7 Some problems remain in Remacle's explanation. He observes that the disappearance of both pre- and postconsonantal *yods* remains obscure in a late [jzj] channel. When did the hush develop? Before or after the disappearance of the postconsonantal *yod*? The disappearance of the preconsonantal *yod* is difficult to understand too, since, normally, it should have formed a descending diphthong with the preceding vowel. But in Walloon this *yod* too lenites out completely (*ibid*, p. 333). The elimination of the postconsonantal *yod* in *[jzj], unexpected in general since s + j usually becomes [ʃ], seems odd in Walloon where, in the modern dialects at least, the assimilatory tendency appears to work (cf. above, 4.2). This change is observable in Walloon dialects at the moment, as well as in the regional French spoken in Belgium and Northern France. *Nation*, *essieu*, etc.--on the model of *Monsieur* = [məṣjø] > [məṡø]--tend to have their hisses rendered more or less hushing in contact with a following *yod*. The loss of the preconsonantal *yod* in *[jzj] is equally intriguing. For one thing, Walloon, with a large number of French North Eastern dialects, has developed a *yod* in hiatus position before front and central vowels: *dorée*, for example, is *dorèye* in Liege, as -ATA in general is -*èye* in Walloon and Lorrain, French -*ie* and -*ille*, [iːj] or [ɛ:j], etc. But in particular there may have been a yod-transition quite late in Walloon, otherwise it seems difficult to account for the vowels of treû < TRES, creûh < CRVCE, -eû < -EBA, etc.

4.8 These problems appear partly solved, it seems, if the hushing channel has been followed in the first place. That is, if these hushes of Walloon are not a secondary development of a *[js] or *[jz] similar to Francien, but if the Francien and Picard [js] and [jz] are secondary developments of a primary [ʃ] or [ʒ]--or, rather [ś] or [ź]--palatal stage, common to all Langue d'Oïl dialects. For example, RATIONE > *[ra'dźone] becomes [ra'źon] in eighth century Walloon, as against *[raj'ẓõn] > raison in Francien. In this hypothesis, the [j] that palatalizes the Walloon cluster is not the preconsonantal parasitic i of Francien, but the Classical Latin (postconsonantal) yod. The hushing friction is the result of a consonant + yod palatalization. The "disappearance" of the two [j]'s in *[jzj] in Walloon is then natural. The postconsonantal one palatalized the consonant and made it hushing. The preconsonantal one never developed as an autonomous or parasitic i. When the consonant was a dorso-palatal fricative *[ś, ź], its preceding yod-transitions were powerful enough to modify the timbre of the preceding vowel in neûh < NVCE, etc., as in treû < TRES. Finally, in Liegeois, the hush weakened and lenited out. Walloon dialects are phonologically archaic in general. That their hushes attest an early stage of Francien may thus seem to be more plausible than the contrary: the French yod + hisses attesting an early stage of Walloon. This seems especially so since, in general, s + j > ʃ is more frequent than j + s > ʃ, and since progressive assimilation is exceptional in Romance languages.

An Economical Channel. An Example in Modern Greek

4.9 The solution outlined above may appear phonologically likely from a phonetic as well as from a phonemic viewpoint. Few changes are needed to account for the reflexes, and the ones posited appear plausible from a phonetic viewpoint. A functional viewpoint in this matter may seem to add some phonological support for this hypothesis. If an intervocalic palatalized cluster is first auditorily recognized by the speakers as different from a non-palatalized intervocalic cluster on the basis of the presence or absence of a yod-transition after the cluster, e.g.: BASSIAT vs BASSA as /'bassja(t)/ vs /'bassa/, the burden of the distinction between the two forms lies on the [j] = /i/ in that position. Phonetic tendencies, at a later stage, tend to assimilate the manner of articulation of /ss/ and the point of articuation of /i/; palatalization takes place. Here the distinction, which phonetically is ['ba^{j}ṩ^{j}a] vs ['basa], may be phonemically interpreted as /'baʃa/ vs /'basa/. It may hence determine a subsequent stabilization of the phonetic contrast as ['baʃa] vs ['basa]. The [^{j}ṩ^{j}] may then depalatalize (lose its yod-transitions) and become a phonemic hush. The speakers may also interpret [^{j}ṩ^{j}], immediately or after a period during which at least some of them intended it as /ʃ/, as a /j + sibilant/ cluster. Here, the burden of the distinction lies, not in the hushing quality of the consonant, but in the preconsonantal yod-transition. In turn, this interpretation renders the [j] the distinctive feature, while the hushing quality of the consonant becomes allophonic, and redundant. At this point, it may appear economical to eliminate this redundancy, and the cluster evolves as [jṡj] › /js/ › [js], as *baisse* vs *basse*.

Such an evolution is observed in Modern Greek dialects by B. E. Newton.[15] The Standard Greek forms /pi'razis, 'fisisa/ 'you tease, I blew' are [pi'rajz, 'fijsa] in some Northern Greek dialects. Budonas's account of this change is summarized in generative terms (p. 9):

	pi'razis	'fisisa
Palatalization	pi'raʒis	'fiʃisa
High Vowel Loss	pi'raʒs	'fiʃsa
Prepalatal Epenthesis	pi'rajʒs	'fijʃsa
Voice Assimilation	pi'rajʒz	'fijʃsa
Palatality Assimilation	pi'rajzz	'fijssa
Degemination	pi'rajz	'fijsa

The [ʃ] is attested in other, stressed, positions: for example /e'sis/ = [i'sis ≈ i'ʃis]. Another account is proposed by Newton, where the source of the *parasitic i* is not the preconsonantal *yod*-transitions of [ʒ, ʃ]--presumably [ż, ṡ] if Budonas is right--but the vocalization of the hush itself, according to the channel [ʃs] › [ṡs] › [çs] › [js] (pp. 13-15). Whatever channel was followed, what is important is that the burden of the distinction was transferred, through a well attested hushing stage, to a *parasitic i*, whose phonetic source lies precisely in the mediopalatal articulation. This evolution reminds Newton of the similar French development; he outlines the development of RATIONE to raison. He reconstructs the channel [tj] > [cš] > [jcš] > [jǰž] > [jdz] > [jz] (p. 9). Apart from its relative chronology, which may be controversial (cf. above, 4.4–4.5), this account coincides with the hypothesis presented in this study. This may be noteworthy in itself, since this version is not unanimously agreed upon in Romance studies. The fact that it was independently arrived at by a phonologist who is not a Romance philogist may suggest that it is not merely an ad hoc solution. This hypothesis suggests to Newton that the disengagement of a first conditioned and redundant feature (here: the preconsonantal yod-transitions) must be in functional relationship with the subsequent dropping of a no longer distinctive feature (here: the hushing quality of the friction). Newton concludes:

> What this suggests is that 'surface redundancies' of a relatively simple nature, which may, however, arise from a complex sequence of rules, enjoy a psychological reality which may manifest itself in the direction taken by subsequent phonological change (p. 15).

That is, the disengagement of a parasitic i indicates to the speaking community a path of economical development: the subsequent reduction of hushes into hisses.

4.10 As a result of this reduction, the hushing phonological space is empty once again, and another palatalized group may start affricating without threatening the economy of the language by phonological mergers in the hushing area. This situation could be described as a pull chain. Francien exhibited another palatalization-affrication process, which produced phonemic hushes, in REPROPIAT > reproche, VACCA > vache, etc.

One may speculate as to whether this was a pull or a push chain, i.e., if velars + a and labials + yod palatalized and affricated as a result of the [jśj] being interpreted as /js/, or if on the contrary [jśj] was interpreted as /js/ because new palatals tended to affricate and become phonemically hushing. At this point, it appears impossible to choose. The first stages of these phonological evolutions for Walloon and Francien may be summarized as:

fig. 3: The Economy of Parasitic i

> /hush/ In Walloon
/consonant + yod/, > *[palatal = hush]
> /yod + hiss/ > [i + hiss]
In Francien

or

> /ʃ/ Walloon
/s + j/ > *[c = ś]
> /j + s/ > [i + s] Francien

The traditional solution may appear less economical for Walloon, since it involves more steps, one of which seems to be less "phonologically likely" than the steps posited for the channel outlined above:

/s + j/ > *[c = ś] > */j + s/ > *[j + ś] > /ʃ/.

4.11 That [ś], [ǰź], etc. may be interpreted in different ways and thus prompt diverging evolutions may appear strange. Yet, are diverging interpretations not often observed? It seems that linguists themselves can disagree on how to interpret phonetic realities phonemically. Why could the speakers not interpret in various manners a given phonic "output" when linguists do? Martinet[16] suggests that this may be especially true of certain phonetic realities, which must then be given the two interpretations. Among these realities difficult to interpret are affricates and palatalized sounds. It thus seems plausible that, even in the course of a phonetically minor development occurring in a short length of time, a palatal affricate or fricative may be perceived in different ways, and hence external factors may determine the interpretation.

The Economy of Palatalization vis-à-vis Heavy Clusters

4.12 Perhaps the interpretation of [ś] as /js/ was partly due to the development of the "heavy clusters" of latin. By heavy clusters are meant CL *STI + vowel*, *SC + j, i, e*, and X.[17] Their development has been accounted for in different ways. Marchot proposes the stages [sk] > [ks] > [xs] > [js] for French *vaisseau* < VASCELLV and from there [js] > [sj] > [ʃ] for the Old Walloon reflex [va'ʃɛ:] (cf. above, 4.6). These steps may appear unnecessary for VASCELLV since there seems to be no difficulty, E being a palatalizing environment, in positing [sc] > [ścś] > [ś:], hence Walloon [ʃ] and Francien [js]. There are, however, more complex cases, which may have involved a metathesis. A. Wallensköld seems to have been the first to systematize[18] the -SC- > -CS- change hypothesis in Gallo-Romance. Metatheses are often irregular. But there is no reason why there should not be one case of regular metathesis in Gallo-Romance if there appears to be no other plausible alternative. Such words as NASCO, FLORISCO, COGNOSCO, etc., Germ. frisk, bosk, maresk, harnask, etc., disengage a parasitic i: (je) nais, fleuris, connais; frais, bois, marais, harnais. They are difficult to explain in phonetic terms. Wallensköld postulates the regular metathesis [sk] > [ks] followed by the development [ks] > [xs] > [js]. The Picard forms fres, bos, mares, harnas are explained by the plural form, where final -s would have prevented metathesis in the cluster [sks]. Paris agrees with the general hypothesis of [sk] > [ks] in Proto-Francien and attributes the Picard forms which show an evolution of the group [sk] without metathesis to their being integrated in the Romance dialect at a different time.[19] Wallensköld's hypothesis is accepted by Hatzfeld and Darmesteter.[20] They also postulate the opposite development [ks] > [sk] in certain cases; aisselle, for instance, seems to derive from VL * ASCELLA rather than from CL AXILLA. The idea of the reversibility of [ks] and [sk] caught on. E. Herzog, who also agrees with it, mentions[21] examples of the opposite evolution, [ks > sk], which seems to explain at least two words: tâcher and lâcher, from TAXARE and LAXARE, through the metathesized forms *TASCARE AND *LASCARE. Tâcher and lâcher seem to derive from *TASCARE and *LASCARE rather than from X forms, since -AXA- becomes -is- and -ASCA- > -ch-, as shown by TAXONE > taisson vs MASTICARE > mâcher, MVSCA > mouche, Germ. friska > fraîche, etc.

4.13 There may be, however, some false problems that obscure the real one. Phonetically speaking it is difficult to see the point of having VASCELLV > *vaksellu (with Marchot) when one proposes AXILLA > ascella (is it attested?) with the authors of the Dictionnaire général.

Analogy with the paradigm seems to explain the *parasitic i* of NASCO, COGNOSCO, etc. In effect, NASCIS, NASCIT, COGNOSCIMVS, COGNOSCITIS, etc. of the conjugation provide the palatalizing context which will regularly account for *tu nais*, *il naît*, *nous connaissons*, *vous connaissez*, etc. Then, **je nas*, **je conos* are remodeled by analogy into *je nais*, *je connais*, as AMO > *j'aim* was replaced by *j'aime*, because of AMAS, AMAT, etc. The Francien forms *bois*, *frais*, etc. are more difficult. Perhaps they were determined by a similar back-formation in the verb system or perhaps their plural *cas sujet* in *-i* provided by itself enough of a palatalizing paradigm: *boski*, *freski*, etc. It is also possible that it is the parallelism between this declension and the -SCO conjugation which caused the palatalized forms to win out in Francien, in verbs as well as in substantives and adjectives. The Picard forms *bos*, *fres*, etc. appear to be the Flemish forms (Modern Flemish and Dutch have *bos*, *vers*, etc.). This evidence seems to support Paris' chronological hypothesis. It seems plausible that in a region of dense Frankish settlement and exceptionally long Frankish-Picard bilingualism,[22] Germanic words were known and kept as such and evolved accordingly.

4.14 Perhaps the heavy clusters *stj*, *sk + j, i, e* and *ks* simplified and merged quite early in Gallo-Romance.[23] After the temporary delay observed by Papirius and Pompeius in the affrication of /stj/ (cf. above, 3.9–3.11), /stj/ and /skj/, then /sk + i, e/ probably merged in *[scš] = *[šcš] = [šš], thus evolving as *[š] later, when geminates simplified.[24] This *[š] is preceded by *yod*-transitions, as a dorso-palatal. Could these *yod*-transitions not have been phonetically "strengthened," or, better, *phonologically "revealed," when X arrived at the point* *[çs] ≈ *[js] ≈ *[š]? That is, perhaps the allophonic *yod*-transition of the dorso-palatal hush came to be perceived in the same way as the functional [j] resulting from the vocalization of [k] in /ks/. X normally disengages a *parasitic i* in Francien. Thus, according to the hypothesis concerning this disengagement (cf. above, 4.5), when this phenomenon occurred, X could no longer have been [ks] or *[cš] since this cluster begins with a voiceless occlusion. The channel which appears most phonologically likely for X may consequently be *[ks] > *[xs] > *[çs]. What is suggested here is a phonological merger between */š/ < CL *stj* and *sk + j, i, e*, and */çs/ < X. The phonetic reality of this merger is the convergence of the two channels towards *[š] or *[çs].

fig. 4: *The Phonological Convergence of the Heavy Clusters*

$$\left.\begin{array}{l} \text{stj} \\ \text{skj} \\ \text{sk + i, e} \end{array}\right\} > \text{sc}\check{\text{s}} > \check{\text{s}}\text{c}\check{\text{s}} > \check{\text{s}}\check{\text{s}} > \check{\text{s}} \approx \text{çs} < \text{xs} < \text{ks} < \text{X}$$

The structural value of this merger seems to have been important. It may be the merger with *[çs] from X which linguistically triggered the autonomous development of the *yod*-transitions appearing before *[š]. During the period of hesitation (cf. above, 4.11) the actualizations of the merging */çs/ and */š/ perhaps relied more and more on their common '*yod*-transition' feature which kept them both distinct from /s/. In Italian, Iberian and Walloon it is the 'hushing' feature which was retained; presumably */šš/ and */çs/ merged in *[š].[25] In Francien, Norman and Picard, however, the '*yod*-transition' feature won out, presumably because of the particular strength of */çs/. This may account for the development observable in the results: *[ś] › *[çs] › [js], interpreted as /j + s/, before evolving further as /vowel + j + s/ › /vowel + i + s/ etc.: *angoisse*, *faisceau*, *vaisseau*, *laisser*, etc. This joint development */ś/ › */çs/ › /js/ may also explain the success of this solution for intervocalic (voiced) occlusives as well. The model was exploited, and *[d́ź] became /jdz/ in the same manner: *raison*, *raisin*, etc.[26]

The Economy of Palatalization vis-à-vis -CT + Non-Yod

4.15 The origin of the particular strength of */çs/, which possibly explains the /js/ of Francien, may have its origin in the parallel development of -CT- followed by a vowel other than *yod* in Langue d'Oïl. When -CT- developed into [xt] › *[çt] › *[jt], the paradigmatic relationship of -CT- and -X- (= -CS-) was never loosened. It was on the contrary strengthened by a similar development of [k]: *[x] › *[ç] › [j] in both cases. The parallelism between /j + s/ and /j + t/ of French, Norman-Picard, Catalan and Portuguese, and /ʃʃ/ and /tt/ of Italian, /ʃ/ and /tʃ/ in Old Castilian, does not seem to be due to chance. It seems plausible that the disengagement of a *yod* distinct from a following palatalized consonant or cluster in Francien and Norman-Picard (in Portuguese and Catalan, only -X- and -CT- give *yod* + dental), is a parallel solution to a similar structural problem. The evolution of -CT- into *yod* + dental appears in fact connected with the evolution of most intervocalic palatalized clusters into the similar *yod* + dental. It is suggested that the disengagement of *parasitic i* in Proto-Francien Gallo-Romance may have been linguistically caused by the development of preconsonantal /k/ in Western Romance, principally in Gaul.

4.16 The channel *-CT- > xt > çt > jt appears to be supported linguistically[27] by the final results and phonological likelihood, but it is not the only plausible one. Meyer-Lübke accepts it as probable but insists that the channel *-CT- > xt > çt > c (> jt) has the advantage of being compatible with the results of all Western Romance ("Beiträge," 1925, p. 648). The palatal is a plausible source for [jt] in Langue d'Oïl and Portuguese, and [cš] in Langue d'Oc and Spain. It is difficult to decide whether the *[c] stage may be considered the latest common development of -CT- in Western Romance, or if [çt] should play that role. There may be an intermediary solution whereby the two pronunciations were possible all over Gaul and Iberia at one time. Then Portuguese and Langue d'Oïl would choose *[çt], Castilian and Occitan dialects *[c]. The two sounds are close to each other and could reasonably be interpreted as diasystematic allophones of one phoneme. The choice *[çt] or *[c], however, seems to account for further developments in the palatal area. In Castilian and Occitan, the *[c] developed according to the normal channel: *[c] > *[cç] [cš]. In some Occitan dialects, [ts] eventually developed from the same cluster. By and large, however, it is the hushing area that this choice was to fill. On the contrary, the *[çt] chosen by Portuguese and French may have contributed to determining the phonemicization of [ç] as a *parasitic i*: /i/ = [j]. In both languages, consequently, hushes could develop from other sources without involving mergers. For Francien in particular, it seems plausible that the palatalization-affrication of *velars + a* has a relationship with the -ś- > [js] choice, as seems suggested by the *[c] or [k'] > [k] "regression" of Norman and Picard. Norman and Picard dialects themselves have a -ś- > [js] choice of their intervocalic palatalized clusters. There is, however, a difference between this limited development and the Francien one. In Norman-Picard, this choice is not structurally completed by a general hush > hiss move in (almost) all positions. In Francien, *cent*, *cire*, *chanson*,*maçon*, etc. followed the movement perhaps started by *laisser*, *taisson*, etc. and spread through *poisson*, *maison*, *raison*, etc.

The Problem of Orge, Argent vs Raison, Raisin

4.17 In this account, two problems remain. The first concerns initial [∂z], still hushing in French. One would normally expect *gent*, *argent*, etc. to have evolved homorganically with *cent*, *mars*, etc. Passy's proposal (cf. above, 3.32) of early deaffrication, seems difficult to accept precisely because it involves a complication in chronology. The change hush > hiss in general seems to have taken place before the eighth century (see below, 4.18-4.30). Deaffrication cannot easily be considered older even if it is admitted that deaffrication of voiced consonants took place much earlier than that of voiceless ones, probably around the eighth century, which is still too late. Also, one does not see why *gent*, *argent* would deaffricate when presumably, within this hypothesis, raison, raisin did not (they would be *rajon, *rajin) since affricates are usually more resistant in initial than in intervocalic position. Moreover, when then did goujon or rage deaffricate? Still earlier? It is perhaps simpler to suppose that the forms raison, raisin, goujon, etc. deaffricated in the eighth or in the ninth century, and that the difference in treatment of raison vs goujon is due to different palatalizations, not to different deaffrications, since these reflexes are parallel to taisson vs reproche. Another exactly opposite solution would consist in positing the affrication of yod after the hush > hiss change. This solution seems, at least for Francien, difficult to accept since [-j] has the same behaviour in word-initial and syllable-initial or post-consonantal positions, and spellings such as ZVNIOR, ZOSIMVS seem to attest affrication in Vulgar Latin. Within this hypothesis, it is also improbable that VL [-j] remains [-j] in Gallo-Romance, then develops as [-dʒ > -ʒ] in Old French since RATIONE > raison, GLORIA > gloire and RADIONE > rayon. One does not see how a yod could have been kept apart from either of these. For Francien, such forms as HORDEV > orge, ARGENTV > argent vs MARTIV > mars and -ARIV > -ier strongly suggest that */dʒ/ remained unchanged throughout the Romance period. Its remaining */dʒ/ when */tʃ/ becomes /ts/ is thus structurally unexplained.

There is the problem evoked above (4.12), concerning lâcher and tâcher. Tâcher seems to come from *taskare, as indicated by similar forms in other languages. It is possible that LAXARE also evolved exceptionally through the metathesis *X > sk*, thus leaving the *doublets* *lâcher* vs *laisser*. The two irregular forms may also derive from a different geographical or social dialect.

A RELATIVE CHRONOLOGY OF GALLO-ROMANCE PALATALIZATIONS

First Relative Chronology

4.18 The solutions proposed to the problems discussed in the preceding section permit the establishment of a tentative chronology, from Classical Latin to Old French, i.e., thirteenth century Francien. This first relative chronology is expressed in the form of laws:

1) first (OL) palatalization
2) first (VL) lenition:
    a) spirantization of intervocalic voiced consonants
    b) sonorization of intervocalic voiceless consonants
3) a) reduction of heavy clusters
    b) disengagement of *parasitic i*
4) first affrication of palatals
5) second (Gallo-Romance) palatalization
6) second (Gallo-Romance) lenition:
    a) simplification of geminates
    b) spirantization of intervocalic voiced consonants
7) delabialization before *i, e, ε*; later, before *a*
8) hush > hiss move
9) second affrication of palatals
10) first deaffrication (voiced intervocalic affricates)
11) third lenition: vocalization (or strengthening) of spirants
12) second deaffrication (all affricates)

This chronology fits in with the philological evidence if the laws are understood properly.

Second Relative Chronology

4.19 Inscriptions and borrowings indicate the appearance of a new allophone. At this point it is a "barbarism." Then it may develop as a "social cleavage," possibly generalized later as a new actualization of the phoneme. Eventually it may become a new phoneme. In traditional linguistics, one would express this development as the time during which a sound law is productive. Frankish loanwords seem to undergo laws 1, 2, 4, etc., i.e., all the Vulgar Latin laws, to the exclusion of law 3: hatjan > *hatire > haĭr, *hulftja > *hultja > housse, *hatio(ne) > haz, *brustja > brosse, *bultjone > bozon etc., thus showing the action of laws 1, 2b, 4, 6a, 6b, 8 and 11. There is only one example (*krostjat > croisse; probably by analogy) of a loanword disengaging a parasitic i--law 3. On the other hand skina gives échine, wikkett > guichet, etc. These changes suggest that the words entered Gallo-Romance between laws 4 and 5 since they have hushes today, like CATTV > chat and Karl > Charles. These two observations appear contradictory: Germanic words cannot enter before law 1 but after law 3. Either the chronology is false or there is a reality difficult to express in terms of laws. The solution may lie in a more versatile model: a model of (possibly socially stratified) allophonic variations of phonemes.

4.20 If the 12 sound laws are rephrased in terms of allophonic variations, the relative chronology may appear as:

chart 1: Allophonic Variations

1)	/t + i + V/ /k + i + V/ /k + i,e/	>	[c]	[k']	[t']	[cç]		>	/c/?
	/i + V/ /d + i + V/ /g + i + V/ /g + i,e/	>	[ɟ]	[g']	[d']	[ɟj]		>	/ɟ/?
	/s + i + V/	>	[š]					>	/ʃ/?
2) a)	/-b-/	>	[b]	[β]	[w]	[v]			
	/-d-/	>	[d]	[δ]	[∅]				
	/-g-/	>	[g]	[ɣ]	[j]				
	/-ɟ-/	>	[ɟ]	[ɟž]	[j]				
b)	/-p-/	>	[b]	[β]				>	/b/
	/-t-/	>	[d]	[δ]				>	/d/
	/-k-/	>	[g]	[ɣ]				>	/g/
	/-c-/	>	[ɟ]	[j]				>	/ɟ/
	/-s-/	>	[z]					>	/z/
3) a)	/-ks-/	>	[xs]	[çs]	>	[jš]		>	/ʃʃ/
	/-sc- + j/	>	[šc]	[šçš]	>	[jšš]		>	/ʃʃ/
	/-ss- + j/	>		[šš]	>	[jšš]		>	/ʃʃ/
b)	/-z- + j/	>		[ž]	>	[jž]		>	/ʒ/
	/-ɟ-/	>	[ɟ]	[ɟž]	>	[jɟž]		>	/dʒ/
4)	/c/, /-cc-/	>	[c]	[cš]				>	/tʃ/
	/-ɟ-/	>	[ɟ]	[ɟž]	>	[jɟž]		>	/dʒ/
5)	/k + a/ /k + i,e/	>	[k]	[k']	>	[c]		>	/k/
	/g + a/ /g + i,e/	>	[g]	[g']	>	[ɟ]		>	/g/
6) a)	/-ss-/	>	[s]	[ṣ]				>	/s/

/-ʃʃ-/ > [jʃ] [js] > [jṣ] > /ʃ/

/-cc-/ > [c] > /c/
etc.

b)/-b-/ > [β] [v] > [ɑ] > /β/

/-d-/ > [δ] [ɑ] > /δ/

/-g-/ > [ɣ] [j] > [ɑ] > /ɣ/

/-j-/ > [j] [ɑ] > /j/

7) /kw/ > [k] > /k/
(thus
/k + i e ɛ a/ > [c] > /c/)

/gw/ > [g] > /g/
(thus
/g + i e ɛ a/ > [ɟ] > /ɟ/)

8) /ʃ/ > [jṣ] [js] > /js/

/ʒ/ > [jẓ] [jz] > /jz/

/tʃ/ > [t'ṣ] [ts] > /ts/

/dʒ/ > [jd'ẓ] [jdz] > /jdz/

(initial /dʒ/ remains [dʒ] /dʒ/)

9) /c/ > [c] [cś] > /tʃ/

/ɟ/ > [ɟ] [ɟz] > /dʒ/

10) /-jdz-/ > [jdz] [jz] > /jz/

/-dʒ-/ > [dʒ] > /ʒ/

11) /β/ > [v] [u] > [ɑ] > /v/, /u/, /ɑ/

/δ/ > [δ] [ɑ] > /ɑ/

/ɣ/ > [ɣ] [j] > [ɑ] > /j/, /ɑ/

/j/ > [j] [ɑ] > /j/, /ɑ/

12) /dʒ/ > [dʒ] [ʒ] > /ʒ/
/ts/ > [ts] [θ] > [s] > /s/
/tʃ/ > [tʃ] [ʃ] > /ʃ/

Integration of Loanwords

4.21 Within this system of allophonic variations, the integration of loanwords becomes easier to understand. _Hatjan_, Latinized in *_hatire_, drops its *[-t-] because it was an impossible sound in that position (law 2b). There could be only [-tt-] or [-d-]; *[-t-] became [-d-], hence, later, [ð] and [∅]. On the other hand, the [tj] cluster in _hultja_, also impossible as such and as *[-c-], could similarly be integrated as either [-cc-] or [-ɟ-]. It chose to evolve like FACCIA, _makjo_, etc., as a *[-cc-]. It thus did not disengage a _yod_. The *[-t-] and *[-tj-] of the Frankish loanwords were integrated as equivalents to their closest Romance counterparts at the time of the invasions: *[-t-] as [-d-] and *[-tj-] as [-cc-]. The reflexes of /k + i, e, ɛ, a/ and of *_hatire_ indicate the _terminus ad quem_ of the borrowings in the evolutionary processes: before laws 5 and 6, since later, they would have become *_Carles_,*_hatir_, etc. *_Hultja_, *_brustja_, etc. on the other hand, seem to indicate the _terminus a quo_: after law 3, since they do not disengage a _parasitic i_ (as FRVSTIARE, for example, does: _froisser_). The loanwords make it possible to attach the relative chronology to the historical scale.

A SECOND RECONSTRUCTION: ABSOLUTE CHRONOLOGY

4.22 Frankish words seem to have been borrowed between laws 3 and 5. It thus appears reasonable to think that the Frankish invasions of

Northern Gaul took place shortly before that time. By his conversion to Christianity (496), Clovis succeeded in mixing the two populations of his kingdom: the Gallo-Roman and the Germanic. It is conceivable that most Frankish words borrowed by the Romance speaking people of Ile-de-France and Champagne, even if not exactly introduced then, started evolving as French words during or immediately after this brief period of popular bilingualism. The cornerstone of this chronology is thus: law 4 = around 500. The first palatalization of velars is an Old Latin phenomenon, difficult to date with precision.[28] The chronology of the changes following law 5 is Richter's, except where it conflicts with the channels established in the preceding pages.

4.23 The laws must be understood as the moment when a new allophone becomes standard. Law 4, first affrication (taken here as an example), is not to be understood as a rule transforming, in all the speakers' competence, palatals into hushes. "Vraisemblance phonologique," as well as the philological data studied in Chapter Three, suggest on the contrary that a hushing pronunciation was a "barbarism" during the Empire, and became more frequent as time went on. The equation Law 4 = around 500 means that, around the beginning of the sixth century, the hushing allophones had become the most frequent ones: the standard pronunciation. This qualification implies that a "superstandard," cleric and learned, pronunciation might still keep palatal occlusives, or even (cf. above 3.15) that an ultimate hypercorrection might have restored velars, dentals + yod, etc. It also implies that a "substandard" pronunciation might actualize these in a hishing, or hissing manner, and disengage a parasitic i from the palatal feature. It is this flexibility which is expressed in the set of allophones of law 4. Each allophone may roughly correspond to a certain level of speech, thus perhaps to a certain social class. All intermediary sounds are also possible. The other rules must be regarded in the same way.

4.24 The laws described in 4.21 seem to "transform" a phoneme into its (new) allophones, then again into a new phoneme, and so on. This procedure raises a difficulty since the phonetic and the phonemic planes do not theoretically merge in that fashion. The second plane is only a functional abstraction of the first one and it is composed of discrete units, whereas the phonetic plane is a continuum. The first and essential justification of these laws is that they allow for a presentation of linguistic evolution. The second justification stems from the idea that these laws may cover a certain psychological reality in language and in language change.[29]

4.25 The hypotheses outlined above and the practical possibilities they give to the linguist trying to reconstruct the phonetic and the mental realities of a little known linguistic evolution may appear advantageous. These ideas and solutions, however, stem from observing and reflecting on how languages function and evolve today. It seems that phonological evolution is not so much the result of a slow, continuous and homogenous sound drift--although it probably is that also--as a replacement, within a given speaking community, of one "norm" by another. The model of language change, and of sound change in particular, that seems to emerge today, based on the observations of Gauchat, Gilliéron, Meillet, Guiraud, and others, and apparently confirmed by the recent investigations of Weinreich, Moulton and Labov, may be compared to the development, not of one organism, but of a living species.

4.26 The phonological system evolves and differentiates when the variations inevitably arising in each individual are taken up by a group within the species, and eventually by the whole species. Wang, "The Chinese Language," compares linguistic evolution with biological evolution; it seems to him that the major selective force between two or more variants, is "the ease with which the forms can be pronounced and properly perceived" (p. 60). This principle, which recalls that of economy, "determines what forms of speech will survive" (loc. cit.). The mechanism of change may thus be envisioned as basically this: variants (in phonology: new allophones) appear; they compete for "survival" with the old norm. A generalized sound change, or sound law, is consequently the triumph of one (new) allophone. It is this mechanism that is expressed in the set of allophones displayed in 4.20. The allophones presented in the left part of the chart, though, are supposed to have developed at an earlier stage than those in the right part, and thus may be considered as steps of a channel.

The Economy of Palatalization in Gallo-Romance

4.27 The proposals presented in the preceding paragraphs, although substantive in essence, must still be examined in relationship with the linguistic structures. The solutions discussed in this chapter must be tested in a general matrix where each relevant consonant or cluster appears confronted, as it is in real language, with other groups. This must be done in diachrony as well, since a language functions and evolves as a whole. It is important that all clusters directly related to the Vulgar Latin and Gallo-Romance palatalizations be grouped and appear on the same chart. A theoretical justification of sound charts as a means of presenting a structural analysis of phonological change has been proposed by Henry M. Hoenigswald, under the self-explanatory title,"Diachronic Sound-Charts: A Technique to Represent Sound Change." He explains that a chart is the best way to present diachronic phonological data. It is the most realistic way, as this is the manner in which in reality phonemes evolve, i.e., by reacting against the whole system. It is also the most reliable way, since a contradiction (or a mere clash, or merger, whose components are later dissociated) would be immediately apparent (p. 81).

The Forty-Three Clusters

4.28 Forty-three consonants and clusters of Classical Latin have an immediate bearing on the Vulgar Latin and Gallo-Romance palatalizations. The Classical Latin forms of these words appear to the left of the GENERAL CHART, on the same level as the consonant or cluster they illustrate. Each cluster is presented in two environments: before

I, E, A (first column), and before O, V (second column). There are two exceptions to this principle of classification. In order to keep the whole chart on two pages for easy consultation, *labials + yod* appear on the second column at the same level as stressed *velars + a*. The groups -CVL(V), -TVL(A), etc., which seem to fall between phonological and morphological realities, are examined only once and illustrated by only one form, AVRICVLA, placed in the second column for the sake of clarity. The treatment of such groups seems to depend on morphology—initial *kl, gl* is unchanged in French to the present—and are outside the "core" (see below, 4.33). For the same reasons *r + yod* is excluded from this study.[30] It appears mainly in -ARIV, -ERIV, etc. suffixes, and /r/, as /l/, does not participate in the core-relations of consonants in Latin or French. However, the limited evolution of /l/ and /n/ + *yod* is added, at the bottom of the chart, because for a long time /ʎ/ and /ɲ/ were the only palatal consonants left in French (/ɲ/ being the only surviving palatal consonant today). The few words containing *m + j* in Latin, and LINEV, which give /n + dʒ/ in Old French, (*singe*, *vendange*, *linge*, etc.) are not included in the chart.

The Sixty Words

4.29 The sixty words chosen to illustrate the evolution of Vulgar Latin and Gallo-Romance consonants and clusters related to palatalization are believed to have undergone a popular Francien development. The Modern French reflexes of the sixty Classical Latin or reconstructed forms are, in order of appearance on the chart: *pièce*, *massue*, *prise*,

raisin, *joli*,[31] *jour*, *rayer*, *rai*, *puisse*, *puis*, *baiser*, *maison*, *angoisse*, *huis*, *laisser*, *taisson*, *naisse*, *poisson*, *lait*, *fait*, *gésir*, *jurer*, *Chayes*, *mai*, *face*, *gras*, *taise*, *gorge*, *Georges*, *courroie*, *essai*, *racine*, *raisin*, *geler*, *sceau*, *qui*, *comme*, *plurent*, *guerre*, *char*, *seiche* (probably a Norman spelling), *payer*, *pigeon*, *jambe*, *changer*, *lier*, *goujon*, *vache*, *mie*, *nage*, *baie*, *quand*, *eau*, *gant*, *oreille*, *fille*, *agneau*, *seing*, *vigne*, *pignon*.

The Seven Periods

4.30 The seven periods dividing the chart are intended to cover the changes described in 4.2-4.21. Seven synchronic divisions seem to be sufficient to distinguish the phonological interplay in diachrony. See, for example, the chain (cf. 4.6-4.8) assumed to have taken place in the palatal area between the end of the Empire and the Carolingian era. This chain is readily visible when the columns 496 and 843 are compared. The columns correspond to the seven divisions, to each of which has been assigned a historical date, for ease of reference. The middle of the Classical Latin period is represented by the date 31 B.C. (-31), when Octavius won the Battle of Actium and "founded" the Roman Empire. Between then and Constantine's Edict of Milan (313 A.D.) there is the period during which Classical Latin became more and more "restricted" to upper class usage, and during which popular or "Vulgar" Latin evolved and grew over all Western parts of the Empire, thus spreading geographically as well as socially. The emperor's conversion to Christianity and the Edict of Milan symbolize the Late Empire and in fact the beginning of the metamorphosis of the ancient civilization.

From then to the Treaties of Verdun, the language spoken in Gaul (Gallo-Romance) starts dialectalizing rapidly. Again a new turn is taken with the invasion and the subsequent assimilation of the Franks, evoked by Clovis' conversion in 496. The language is still believed to be Latin, but its dual nature is indicated by the name Gallo-Romance: it is Latin, but that "variety" or "accent" of it spoken in Gaul. The Carolingian epoch is the crucial moment when "the new language is born." It is symbolized by the date 843, The Treaties of Verdun, closely following the Oaths of Strasburg (842). The next period is that of Early Old French, which ends in the middle of the eleventh century, around the time of the Battle of Hastings (1066). This point marks in turn the beginning of the Classical Old French culture, which reaches its peak around the end of the thirteenth century. Two divisions are made in this period. One is denoted by St. Louis' birth, 1226, the other by the beginning of the Hundred Years War, 1327. The longest period in the chart is that of Late Gallo-Romance (347 years), followed by that of Latin (343 years), then Early Old French (223 years), Early Gallo-Romance (183 years), Early Classical Old French (160 years), and Late Classical Old French (101 years). Relative and absolute chronologies appear on the chart but the number of the laws presented in 4.18-4.20 is added in each column for convenient checking. For example in the first two columns, which correspond to the divisions made in 31 B.C. (-31) and 313 A.D. (+ 313), the numbers of laws 1, 2 and 3 appear, meaning that the set of allophones they describe is in general use at these points. Law 1, however, is bracketed because the so-called Vulgar Latin palatalization is in fact an Old Latin phenomenon (cf. above, 3.29-3.30). These divisions may be schematized as:

...	Old Latin	-31
-31	Classical and Vulgar Latin (343 years)	+313
+313	Early Gallo-Romance (183 years)	496
496	Late Gallo-Romance (347 years)	843
843	Early Old French (223 years)	1066
1066	Early Classical Old French (160 years)	1226
1226	Late Classical Old French (101 years)	1327
1327	Late Old French	...

The labels attached to these divisions, useful in the phonology of palatalization, do not have any cultural, or even globally linguistic, value. They are intended solely to allow for easy reference to the paradigmatic analysis below (4.31-4.36). Classical and Vulgar Latin are supposed to be understood as neither synchronic nor diachronic terms; it is suggested that the "Vulgar" Latin spoken by the majority around the end of the Empire developed from a substandard form of speech limited, in Augustus' time, to a minority.

GENERAL CHART: Evolution of palatalized consonants and clusters from CL to Old French

CL forms			-31		+313		496		843		1066		1226		1327	
clusters	before I,E,A	before O,V	(1)		2	3	4	5 6	7	8	9	10	11		12	
(k)tj	*PETTIA	*MATTEVCA	tt'	tt'	c	c	cś	cś	ts	ts	ts	ts	ts	ts	s	s
-tj	PRETIAT	RATIONE	t'	t'	ɟ	ɟ	jɟź	jɟź	jdz	jdz	jz	jz	iz	iz	i+z	i+z
dj	*DIABOLIVV	DIVRNV	d'	d'	ɟ	ɟ	ɟź	ɟź	ɟź	ɟź	ɟź	ɟź	dʒ	dʒ	ʒ	ʒ
-dj	RADIARE	RADIV	d'	d'	j	j	j	j	j	j	j	j	j	i	j	i
sj	*POSSIAT	*POSSIO	ss'	ss'	ś	ś	jś	jś	js	js	js	js	is	is	i+s	i+s
-sj	*BASIARE	MANSIONE	s'	s'	ź	ź	jź	jź	jz	jz	jz	jz	iz	iz	i+z	i+z
-stj	ANGVSTIA	OSTIV	st'	st'	śc	śc	jś	jś	js	js	js	js	is	is	i+s	i+s
-ks	LAXARE	TAXONE	ks	ks	çs	çs	jś	jś	js	js	js	js	is	is	i+s	i+s
-skj	NASCIAT	PISCIONE	sk'	sk'	śc	śc	jś	jś	js	js	js	js	is	is	i+s	i+s
-kl	LACTE	FACTV	kt	kt	çt	çt	jt	jt	jt	jt	jt	jt	it	it	i+t	i+t
j	IACERE	IVRARE	j	j	ɟ	ɟ	ɟź	ɟź	ɟź	ɟź	ɟź	ɟź	dʒ	dʒ	ʒ	ʒ
-j	CAVEAS	MAIV	j	j	j	j	j	j	j	j	j	j	i	i	i	i
kj	*FACCIA	BRACCHIV	kk'	kk'	c	c	cś	cś	ts	ts	ts	ts	ts	ts	s	s
-kj	TACEAT		k'		ɟ		jɟź		jdz		jz		iz		i+z	
gj	GVRGIA	GEORGIVS	g'	g'	ɟ	ɟ	ɟź	ɟź	ɟź	ɟź	ɟź	ɟź	dʒ	dʒ	ʒ	ʒ
-gj	CORRIGIA	EXAGIV	g'	g'	j	j	j	j	j	j	j	j	i	i	i	i
k$\overset{i}{e}$	RADICINA		k'		c		cś		ts		ts		ts		s	
-k$\overset{i}{e}$	*RACIMV		k'		ɟ		jɟź		jdz		jz		iz		i+z	
g$\overset{i}{e}$	GELARE		g'		ɟ		ɟź		ɟź		ɟź		dʒ		ʒ	
-g$\overset{i}{e}$	SIGILLV		g'		j		ø		ø		ø		ø		ø	

	CL forms		-31		+313		496		843		1066		1226		1327	
clusters	before I,E,A	before O,V	(1)		2	3	4 5	6	7	8 9	10		11		12	
k^{wi}	$Q^{V}I$	QVOMODO	k^{w}	k^{w}	k^{w}	$k^{(w)}$	$k^{(w)}$	k	k	k	k	k	k	k	k	k
$-k^{wi}_{e}$	PLACVERVNT		k^{w}		g^{w}		w		u		ɯ		y		y	
g^{wi}_{e}	*GWERRA		g^{w}		g^{w}		$g^{(w)}$		g		g		g		g	
$\underline{k}^{a}$	CARRV	*SEPPIA	k	pp'	k	pç	c	pç	cś	pś	cś(ɟ)	cś	ţʃ	ţʃ	ʃ	ʃ
$-\underline{k}^{a}$	PACARE	PIPIONE	k	p'	g	bɟ	ɟ	bɟ	ɟ	bź	ɟ	ɟź		dʒ	ɟ	ʒ
$\underline{g}^{a}$	GAMBA	CAMBIARE	g	b'	g	bɟ	ɟ	bɟ	ɟź	bź	ɟź	ɟź	dʒ	dʒ	ʒ	ʒ
$-\underline{g}^{a}$	LIGARE	GOBIONE	g	b'	ɟ	bɟ	ɟ	bɟ	ɟ	bź	ɟ	ɟź	ɟ	dʒ	ɟ	ʒ
k^{a}	VACCA		kk		k		c		cś		cś		tʃ		ʃ	
$-k^{a}$	MICA		k		g		ɟ		ɟ		ɟ		ɟ		ɟ	
g^{a}	NAVIGAT		g		g		ɟ		ɟź		ɟź		dʒ		ʒ	
$-g^{a}$	BAGA		g		ɟ		ɟ		ɟ		ɟ		ɟ		ɟ	
k^{wa}	QVANDO		k^{w}		k^{w}		k^{w}		$k^{(w)}$		k		k		k	
$-k^{wa}$	AQVA		k^{w}		g^{w}		w						ɛ ə		ɛa ə	
g^{wa}	*GWANTE		g^{w}		g^{w}		g^{w}		$g^{(w)}$		g		g		g	
-kul-		AURICVLA		$k^{(u)}l$		ɟʎ		ʎ		ʎ		ʎ		ʎ		ʎ
-lj	FILIA		l'		ʎ		ʎ		ʎ		ʎ		ʎ		ʎ	
-gh	AGNELLV	SIGNV	ŋn	ŋn	ɲm	ɲ	ɲ	ɲ	ɲ	ɲ	ɲ	ɲ	ɲ	ɲ	ɲ	ɲ
-n(d)j	VINEA	*PINNIONE	n'	n'	ɲ	ɲ	ɲ	ɲ	ɲ	ɲ	ɲ	ɲ	ɲ	ɲ	ɲ	ɲ

Towards a Phonological Representation

The Palatal Matrix

4.31 A) The changes tentatively reconstructed on the general chart may be interpreted from a phonological viewpoint. A first level of abstraction is attained with the following matrix, which represents the phonological space used in the Vulgar Latin and Gallo-Romance palatalizations (chart 2):

	i	e	a	o	u
kw[32]	kwi	kwe	kwa	kwo	kwu
k	ki	ke	ka	ko	ku
(kj =)k'	k'i	k'e	k'a	k'o	k'u
(tj =)c	ci	ce	ca	co	cu
cś	cśi	cśe	cśa	cśo	cśu
ts	tsi	tse	tsa	tso	tsu

B) In Early Old Latin this space was not exploited. The phonological reality of that stage seems to have been:

	i	e	a	o	u
kw	1	2	3	4	5
k	6	7	8	9	10
k'					
c					
cś					
ts					

C) 1. The tendency toward palatalization materialized in the next step, which opened a new phonetic area to phonological exploitation:

	i	e	a	o	u
kw	1	2	3	4	5
k	6	7	8	9	10
k'	↓ –	↓ –	–	–	–
c					
cš					
ts					

2. In Classical Latin the /k'/ order is massively developed when I in hiatus becomes yod and palatalizes preceding consonants, both velars and dentals. This results in a situation where the two palatal occlusive orders are filled almost completely: [k'i, k'e] = CI, CE; [k'a, k'o, k'u] < /kIa, kIo, kIu/ (11, 12, 13); [t'a, t'o, t'u] < /tIA, tIO, tIU/ (14, 15, 16):

	i	e	a	o	u
kw	1	2	3	4 ↓	5 ↓
k	–	–	8	9	10
k'	6	7	11	12	13
c	–	–	14	15	16
cš					
ts					

At this point *ki and *ke are impossible, as well as ci and ce, but these have become real holes in the phonological structure, since kja, *kjo*, *kju* (11, 12, 13) are now integrated in the same order as /k'i/ and /k'e/ (6, 7), and since *tja*, *tjo*, *tju* have in turn started a new order. This /c/ order distinct from the /k'/ one may be posited because of the discrepancy found in some Italian reflexes, as *prezzo* vs *faccia*, where /t'/ > /ts/ vs /k'/ > /tʃ/, but is not structurally necessary for Gallo-Romance. This hypothetical distinction was difficult to maintain, at least as a distinction in point of articulation; but many /k'/ were kept apart from /c/ by geminating: RATIONE > *raison* vs GLACIONE > *glaçon*.

D) This unbalanced situation is remedied in Vulgar Latin by the merger of the two palatalized orders. The labiovelars *kwo* and *kwu* (4, 5) merge with *ko*, *ku* (9, 10). The palatal order has a tendency to affricate and become hushing. Velars + /a/ may already show a tendency to palatalize:

	i	e	a	o	u
kw	1	2	3	–	–
k	–	–	8	4,9	5,10
k'	–	–	–	–	–
c	6	7	11,14	12,15	13,16
cš					
ts					

E) Gallo-Romance does not delay before reinvading the space of the *k'* order. This is done by *k* + a which now shows the tendency towards palatalization. At this moment in the development of the language, Germanic words enter Gallo-Romance. The structure integrates their "palatalizable" clusters. A *kjo is impossible at this point; Germ. kjo is integrated as co (IV). But ki, ke, ka (I, II, III) fill the two holes left empty in the k order by 6 and 7, and III merges with 8. Thus the palatalizing tendency of Early Gallo-Romance applies on a complete /k/ order before front vowels, /kI, kE, kA/:

	i	e	a	o	u
kw	1	2	3	–	–
k´	I	II	8,III	4,9	5,10
k'	↓ –	↓ –	↓ –	–	–
c	6	7	11,14	12,15,IV	13,16
cš	↓ —	↓ —	↓ —	↓ —	↓ —
ts					

(The Roman numerals denote the etyma of Germanic origin: I, II, III and IV denote Germanic ki, ke, ka, kjo, respectively.)

F) 1. The tendencies towards palatalization and affrication materialize and become generalized during the period of turmoil that follows the Invasions as popular pronunciation takes over. The parasitic i's are disengaged and the palatalized clusters of Vulgar Latin continue their shift towards the front of the mouth. The labiovelars start delabializing before front vowels:

	i	e	a	o	u
kw	1	2	3	–	–
k	±	±	–	4,9	5,10
k'	I	II	8,III	–	–
c	±	±	±	–	–
cš	6	7	11,14	12,15,IV	13,16
ts	±	±	±	±	±

2. During the Late Gallo-Romance epoch, three other distinct changes take place: kwi and kwe delabialize, followed by kwa,[33] and the hushing affricates depalatalize in hisses. The Gallo-Romance palatalization is completed, and the new palatals show a tendency to affricate:

	i	e	a	o	u
kw	–	–	3	–	–
k	1	2	±	4,9	5,10
k'					
ç	I	II	8,III	–	–
cš	±	±	±	–	–
ts	6	7	11,14	12,15,IV	13,16

3. Then, the new palatals affricate, and the palatal area is that of the Early Old French core-system:

	i	e	a	o	u
kw					
k	1	2	3	4,9	5,10
k'					
c					
cš	I	II	8,III	-	-
ts	6	7	11,14	12,15,IV	13,16

G) After having been briefly exploited, the palatal space is left more or less empty again. For Francien, the development of palatalization stops at the point of articulation reached at this stage. The hushes, however, depalatalize and become retroflex in Classical Old French. The *cš* order becomes entirely occupied when, from 8, III, the *cšo* and *cšu* holes, later *tʃy* as well, are filled by CALDV > *chaud*, CAVLE > *chou*, CADVTV > *cheü*, later *chu*. With these changes the Late Old French stable pattern is arrived at:

		i	e	a	o	u
	kw					
	k	1	2	3	4,9	5,10
	k'					
	c					
(cš >)	ʃ	I,8	II,8	8,III	8	8
(ts >)	s	6	7	11,14	12,15,IV	13,16

Examples of these 24 reflexes are (Modern French spelling): 1 QVI > *qui*, 2 QVOD > *que*, 3 QVANDO > *quand*, 4 QVOMODO > *comme*, 9 COMPVTARE >

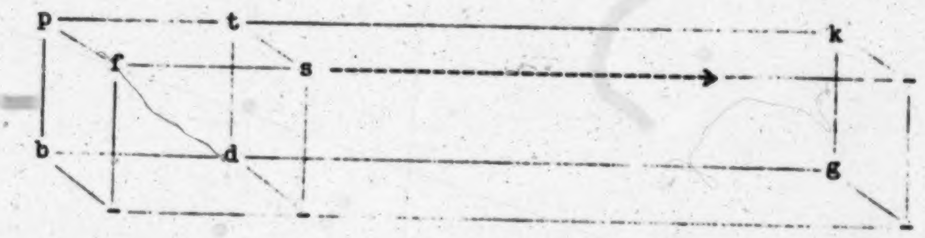
conter, 5 COQVV › coq, 10 CVLV › cul, I *skina › échine, 8 CANE › chien, II *wikkett › guichet, 8 CARV › cher, 8 CATTV › chat, III *skarpa › écharpe, 8 CALDV › chaud, 8 CAVLE › chou, *CADVTV › chu, 6 CISTERNA › citerne, 7 CERVV › cerf, 11 FACIA › face, 14 *PLATTEA › place, 12 FACTIONE › façon, 15 HERICIONE › hérisson, IV *makjone › maçon, 13 BRACCHIV › bras, 16 *MATTEVCA › massue.

The Consonantal Matrix

4.32 A) The phonological space of the consonantal area used here is the space of maximal extension of the core-system during its development from Latin to French (chart 3):

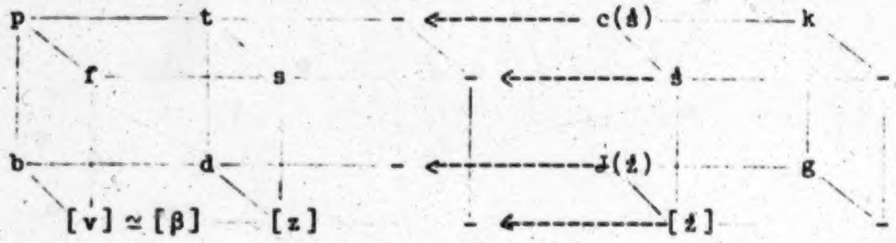
	Labial Order		Dental Order		Hissing Order		Hushing Order		Velar Order	
	Occlusive	Fricative	Occlusive	Fricative	Occlusive	Fricative	Occlusive	Fricative	Occlusive	Fricative
voiceless										
voiced										

B) In Latin, this space is more than half empty:

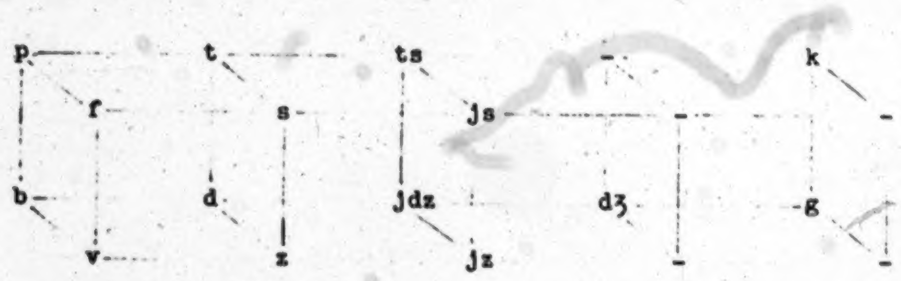


The /s/ of Classical Latin may have been actualized as [s] ≃ [ṣ] ≃ [ʃ], as is contemporary /s/ in Spanish, Dutch or Greek, since there was, as in these, no hushing phonemes at this time. This situation is symbolized by the dotted arrow. Raymond Sindou observes that the nature of /s/ in Latin is not known, and that it may have been different from the hiss, [s], of French or Italian.[34] Martinet conjectures that a hish, [ṣ] = /s/ is frequent in languages without a /ʃ/ (like Classical Latin).

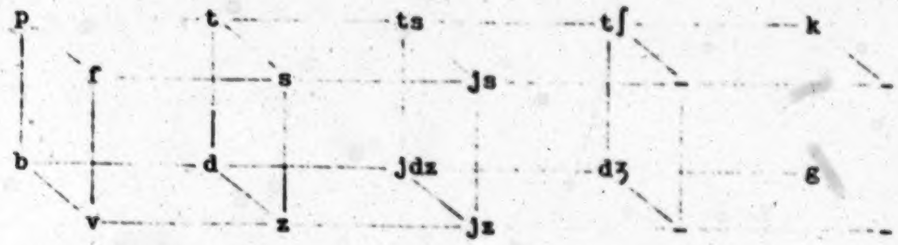
C) The sequences [s + j, t + j, k + j, i] etc. become actualized more and more regularly with a hush, and the hushing sounds tend to become phonemes in Gallo-Romance. First, the Classical Latin sequences ss + j and s + j become the phonemes /ʃ/ and /ʒ/ as against /s/ and /z/ = ss and s. By correlation with these, and also because of the merger of dentals + yod with velars + yod, i, e (and [ɛ]) into a unique [c, ɟ] ≈ [cš, ɟž] set of allophones, the palatal order has its four series:



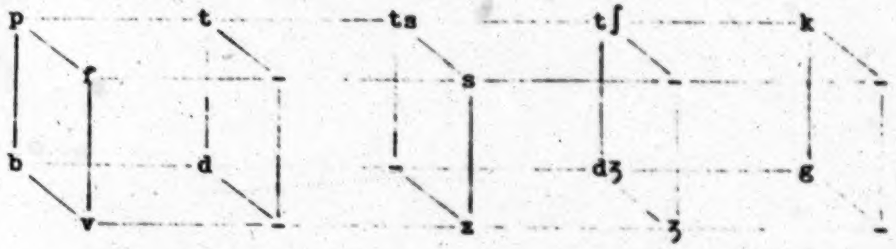
D) 1. As the hushing sounds (except the voiced articulation in initial position) start depalatalizing and disengaging a parasitic i there appears the unbalanced system:



2. The hushing order is strengthened again when the new palatals affricate:



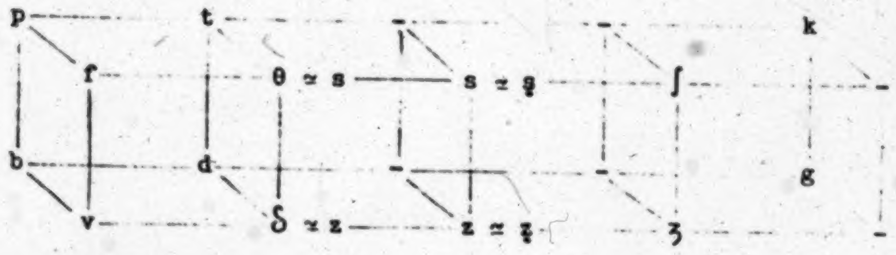
E) As the *parasitic i* becomes autonomous a phonemic merger takes place: the fricatives of the dental and hissing orders merge as one phoneme. The dental order loses its fricatives. The intervocalic voiced clusters /jdz/ and /dʒ/ deaffricate, but there remains a /dʒ/ in initial position:



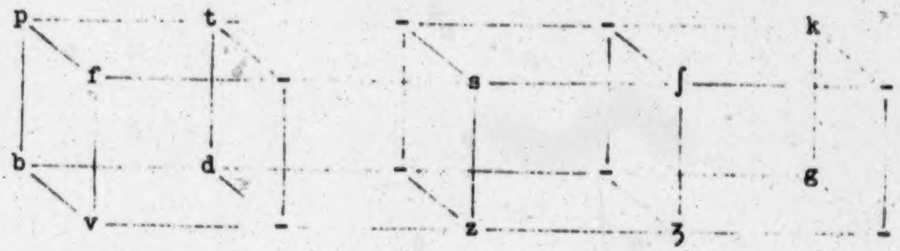
This core system of Early Old French appears unbalanced because of the /dz/ and /ʃ/ holes. The /dz/ hole appears difficult to reach, but not the /ʃ/, which becomes filled if the /tʃ/ deaffricates. Then deaffrication may be generalized, and solve the problem of the /ts/ left without a voiced counterpart.

F) 1. At this stage, as in the previous one, but less than in Latin, the tendency might have existed to actualize the hissing fricatives in a more or less hishing or hushing manner. But in Latin there was no /ts/ (let alone a /ts/ opposed to a /tʃ/) which now probably exerts an attracting influence on the fricatives, and tends to keep them homorganic with itself.

2. However, some dialectal forms with [ʃ] from Latin S, as against some other forms with [s] < Early Old French [ts], seem to indicate at least a hishing pronunciation of the fricatives at this point.[35] Mediaeval Arabic transcriptions usually use the shīn, not the sīn, to symbolize the /s/ phoneme of Early Old French. Alvaro Galmés de Fuentes thus suggests that Classical Old French, as Modern Spanish, had rather hishing sibilants,[36] and that, when /ts/ deaffricated (in the 13th century), it was kept distinct from the old /s/ on a basis similar to that of Castilian: as /θ/ vs /s/ or /s/ vs /ṣ/. (It could not have been /s/ vs /ʃ/ since when /ts/ deaffricates, /tʃ/ and /dʒ/ do also, and today the old /s/ has merged with the old /ts/, not with the old /tʃ/.) Thus there may have been, after deaffrication, a stage when the system[37] was:



G) At any rate, the hypothetical dental fricatives soon merged with the hisses, so that the Late Old French situation is:



The Core System

4.33 There is a deep similarity between this Consonantal Matrix and Dorfman's Core System, as it is described in "Correlation and Core-Relation," pp. 83-88. In particular there is a clear ressemblance between the way consonants move on the matrix and Dorfman's Old French Core Systems (pp. 95-96). The reconstructions outlined above may now be interpreted in a strictly phonemic framework. This phonemic framework does not take into account the phonological space as long as there is no tendency to exploit it phonemically. Holes, in other words, exist only when they appear as structural holes in a phonological pattern of really existing phonemes. Phonological holes are not phonetically possible but actually inexistent actualizations, but exist as a possible new combination of already existing distinctive features; they exist only by correlation. Thus the purpose of this last section is to discuss the hypothetical solutions suggested in this study in the light of the phonological framework presented by Dorfman in "Correlation and Core-Relation."

From Classical Latin to Early Gallo-Romance

4.34 A) 1. The phonological space used above concerning the hushing and hissing areas seems comparable to Dorfman's conception of a phonological zone: "There is room in the palatal zone..." ("Correlation and Core-Relation," p. 89). Both terms suggest that the phonetic reality of the phonological structures is taken into accoutn.

2. Palatalization of velars + front vowels is a phenomenon that seems to have taken place earlier than the elimination of quantity as a distinctive feature, prior thus to the development of yod (cf. above, 3.29-3.30). In Vulgar Latin velars + j, i, e and dentals + j appear to have merged quite early as palatal occlusives (cf. above, 3.2-3.15). It may thus appear doubtful that these "will eventually merge as [ć ź]" (loc. cit.). This "classic" solution may appear all the more questionable because hushes seem to be the more frequent first stage of a palatal affrication, because hisses appear less capable than hushes of disengaging a parasitic i, and because [ssj] and [sj] would be expected, within this hissing channel, to have merged with [ss] and [s]; they have not.

3. The labiovelars /k^w/ and /g^w/ + /i, e/ do not seem to have delabialized until after the Invasions, otherwise they would be hushing today, like skina > échine, Rikhild > Richeut, etc. As a result, the appearance of the palatals as phonemes may not depend on the delabialization of the labiovelars before /i, e/: k^w > k vs k > c. In the environment of /a/, however, the opposition /k/ vs /c/ seems to have been possible, if, as suggested above, MATTEA and FACIA, for example, had become

/maca/ and /faca/ vs /maka/ < VACCA. The same type of opposition could also appear before /o, u/: MATTEVCA, *makjone* > /macuga, macone/ vs /kuba, bakone/ < CVPA, *bakkone*. Besides, if /ʃ/ exists, [c, ɟ] or [cś, ɟź] may have to be regarded as palatal phonemes also, by correlation (cf. above, 4.2).

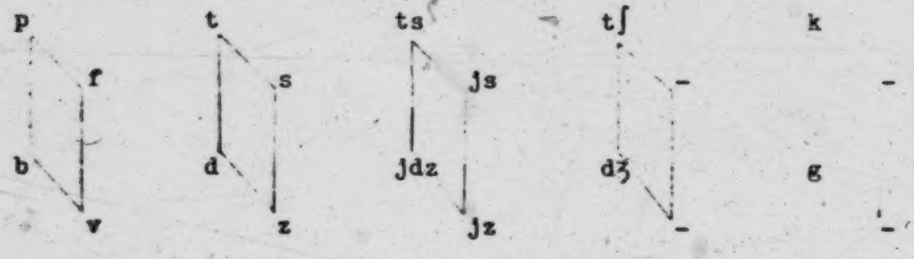
From Gallo-Romance to Early Old French

4.35 1. The completion of degemination strengthens the core system by achieving the establishment of the voiced fricatives as phonemes.

2. Dorfman's hypothesis according to which [ts] and [tʃ] are combinatory variants of the phoneme /ts/ when the Latin *velars + a*, etc., had in turn affricated, seems difficult to accept, from a phonological as well as from a chronological viewpoint (see *ibid.*, pp. 94-95; cf. above, 3.33). From a *strictly phonemic* viewpoint, it may also raise some difficulties. If there is one phoneme /ts/ with the combinatory variants [ts] before /i, e/ and [tʃ] before /a/, it seems necessary, to account for the divergence in result MATTEA, GLACIA > *masse*, *glace* vs VACCA, CARRV > *vache*, *char*, to posit a different environment after the /ts/. If, however, the phonemic divergence rests on the existence of a /i/ in hiatus after the /ts/ in the first two examples, i.e., if *['mats(j)a] = /matsia/, *['glats(j)a] = /glatsia/ vs *['vatʃa] = /vatsa/, *[tʃar] = /tsar/, there may appear a difficulty insofar as it seems improbable that the observable hiss of *masse*, *glace* would be the reflex of /ts/ + *yod* while the hush of *vache*, *char* would be the reflex of /ts/ (+ /a/).

If /ts/ and /tʃ/ have already phonemicized, the Early Old French core system may be schematized as (chart 4):

The Early Old French Core System

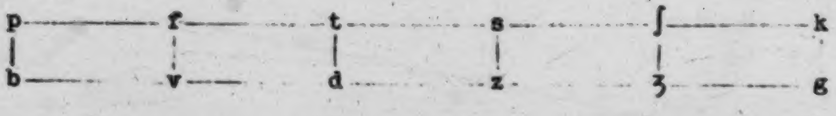


This core system is similar to the matrix presented in 5.32 D) 2, as the 5 orders have been started.

From Early Old French to Late Old French

4.36 As there remain phonemes in all five orders, the core systems derived here are similar to the matrices of 5.32, from D to G. At this last point, with the important reduction caused by the deaffrications and mergers of Late Old French, the core may now be interpreted in an entirely different way. Martinet, observing that no more than two phonemes were phonetically homorganic, suggested[38] that it was the point of articulation which was now the distinctive feature between /p/ and /f/, /t/ and /s/, etc. (chart 5):

The Late Old French Core System



This interpretation seems justified by the parallel observations that it appears phonologically stable, since it is perfectly integrated (all potential holes are filled by phonemes), and that it has since remained unchanged, at least in Standard French.

4.37 The stability attained in Old French is not perfect; many regional varieties of Modern French derived from it show on the contrary evolutionary tendencies comparable to the Latin and Romance developments. Phillips reports that hushing affrication has taken place in Louisiana Cadian, transforming into [tʃ, dʒ] the palatalized occlusives derived from dentals + yod, velars + yod and high front vowels (cf. above, Chapter One, note 8). This development may in fact fill a structural hole; if Dorfman's Modern French core system is accepted (see ibid., pp. 97-98), the emergence of /tʃ, dʒ/ in some of the dialects appears to strengthen the palatal order by providing occlusive counterparts to /ʃ, ʒ/. The palatalizations of Gallo-Romance dialects thus seem to support the view expressed by William Labov that "the internal relations of linguistic elements determine the direction of sound change."[39]

NOTES TO CHAPTER FOUR

[1] Phonological features are functional abstractions of phonetic characteristics. As phonetic characteristics they are subject to phonetic conditioning. As functional abstractions they are subject to mental pressures and allow for a linguistic classification of sounds (cf. above, 2.20-2.27).

[2] Also see Dorfman, "Correlation and Core-Relation," pp. 81-89, Claude Hagège, "Phonologie," and Giovanna Madonia, "Economie."

[3] "Dialectología y estructuralismo diacrónico," p. 80.

[4] This is not the case of Modern English, for instance, where there are hushing phonemes. In spite of this functional difficulty--i.e., mergers will occur: in British English dew vs Jew, in American English picture vs pitcher for example--the hushing development process takes place.

[5] At one point in the history of English, measure, pleasure, leisure, etc. must have known alternations similarly hesitating between [ž] and [z + j]. If the hissing channel of palatalization has been the one taken by Latin, there appears a phonological difficulty. For if /t, d + j/ become /ts, dz/, it seems that /s + j/ should similarly develop as /s/, and merge with the Latin phoneme /s/. This merger, however, did not occur, and a parasitic i was disengaged from the palatalized cluster.

[6] La Constitution phonique du mot wallon, pp. 114-115.

[7] One can further conjecture that it was a pull chain that took place in Proto-Francien. That is, that the Romance [tʃ] became [ts] before the new palatalization developed, in which case there was a [tʃ] hole in the pattern. The hole then would have "attracted" a palatal > hush evolution of any phoneme—or sequence of phonemes—in the system. However, the embryonic Romance palatalization of Norman-Picard, which regressed, in the case of velars, to the velar point of articulation, seems to support the hypothesis of a push chain, successful (in Francien) or unsuccessful (in Norman and Picard). Norman-Picard labials + yod merged with the old hushes.

[8] This distinction would be reflected today by the fact that in intervocalic position [tj] > [jz] whereas [kj] > [s]: RATIONE > raison vs FACIA > face. But since k + i, e gives [jz] also—VICINV > voisin, RACEMV > raisin—this discrepancy seems to have another cause. This in effect may explain not only the non-disengagement of a parasitic i from [kj], but also its remaining voiceless. It is the traditional hypothesis of a gemination: FACIA > *FACCIA > face, GLACIA > *GLACCIA > glace, etc., and exceptionally for dentals + yod: PLATEA > *PLATTEA > place, Gaulish PETIA > *PETTIA > pièce (compare with Italian ghiaccia, piazza, etc.). A gemination seems to explain the non-disengagement of a parasitic i (see below, 4.5) and the voicelessness of the contemporary result. It is phonetically plausible insofar as, the point of articulation of labials and velars being far from that of yod, a special (muscular) attention was devoted to these clusters and resulted in their strengthening, or lengthening, i.e., in gemination.

[9] "Review of M. Leumann and J.B. Hofmann, *Lateinische Grammatik*," p. 69.

[10] MAESTER for MAGISTER recalls the "M'sieur, 'sieur," almost [pśjø, śjǿ], of French pupils addressing their teachers. Meillet is certainly right in considering these forms enclitical and thus subject to hard treatment. But, since lenition finally occurs throughout the lexicon, one may suppose that these forms were the channel, or the occasion, of the subsequently generalized sound change rather than haphazard modifications of tool-monemes.

[11] The sonorization law seems to be valid for voiceless fricatives in general, not just for /s/; the Greek loanwords Στέφανοσ, σαρκόφαγοσ are *Estienne*, *sarcueil* in Old French. The hushes [ʃ] or [ś] would thus sonorize also. It seems consequently equally plausible to see BASIARE > *[ba'sjare › ba'śare › ba'źare] › *baiser* as it is *[ba'sjare › ba'zjare › ba'źare] › *baiser*. On the other hand, X does not sonorize: LAXARE › *lâcher* = *laisser*, TAXONE › *taisson*, AXILLA › *aisselle*, etc., are regular. This argument, however, would be premature here since many scholars believe that there were *sk › ks* as well as *ks › sk* changes in Vulgar Latin, which might modify the resistance of the cluster to sonorization. Besides, the value of CL "X" is not known with certainty (see 4.12-4.14).

[12] Not to be confused with *parasitic i* are the [i] in *payer*, *baie*, etc., which are the palatal reflexes of intervocalic C or G, spirantized in [γ] and palatalized in [j], or the [i] of *trois*, *foi*, *étais*, etc.,

reflexes of the diphthongization of long free stressed Ē, (in TRES, FEDE, ST[ARE] + EBA).

[13] *Les Variations de l'H secondaire en Ardenne liégeoise*, pp. 200-204. In Standard Liegeois Walloon, NVCE > *neûh*, CRVCE > *creûh*, *AVCELLV > *oûhê*, *COCINA > *couhêne*, VICINV > *vihin* = *vèhin*, TITIONE > *tihon*, PVTEARE > *poûhî*, POTIONE > *poûhon*, RATIONE > *rahon*, etc. (pp. 67-70). This /h/ has the allophones: [h], [ç], [x] and [χ].

[14] Remacle, *Les Variations*, p. 332, note 1.

[15] "Sibilant Loss in Northern Greek," p. 9. The examples and the first explanation given are E. Budonas's, *Meléte perì toû glossikoû*, quoted by Newton.

[16] "Review of N.S. Trubetzkoy, *Grundzüge*," p. 28.

[17] Such clusters as R + consonant + palatal: BORDEV, MARTIV, ARGENTIVM, ARCELLV etc., do not raise any special problems. Their treatment is similar to that of a word-initial palatalized cluster. CL -CT + j- evolves in the same way as -TT + j- or -C + j, i, e: LECTIONE > *leçon* as *PLATTEA, FACIA > *place*, *face*, etc.

[18] "Un Cas de métathèse constante pendant la période de formation de l'ancien français," quoted by Paris (see note below).

[19] "Review of A. Wallensköld, 'Un Cas de métathèse,'" p. 103.

[20] *Dictionnaire général*, p. 4, note 4. But on page 140, one reads "axilla, aisselle" as if the evolution were regular.

[21] "Review of E. Bourciez, *Précis*," p. 359.

[22] Some villages in the French Département du Nord still speak Flemish; in the neighbouring Belgian Flanders, Flemish, or Dutch, is spoken.

[23] The comparison with the Italian and Iberian reflexes may even lead to the hypothesis that they merged in Late imperial Latin; cf. Italian *angoscia*, *fascio*, *lascia*, etc.

[24] Italian has kept these as geminates, as the system allows them; geminates did not simplify in Italian.

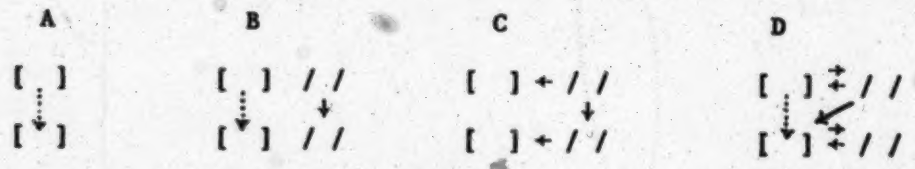
[25] The merger may have taken place through the variants *[çs] ≃ *[çṣ] [ʃʃ] ≃ [ṡṡ].

[26] *maison*, *baiser*, etc. < MA(N)SIONE, BASIARE, followed the same pattern as their voiceless counterparts: [ż] > [jz].

[27] This change seems to be attested philologically by Celtic inscriptions. A preconsonantal C is often rendered by the symbol "X." Georges Dottin, *La Langue gauloise*, p. 48, explains that this is not the Latin letter. For Dottin, -CT- had already become [xt] in Gaulish (p. 98). Wartburg, *La Fragmentation*, p. 36, acknowledges this discovery and gives the examples *Luχterios* for *Lucterios*, *Piχtilos*, *Rectugenus*, *Reχtugenos*, *Reitugenus*, and refers to Dottin. This change seems to be due to the Celtic substratum, in spite of the fact that it spilled over the Celtic area of settlement, as indicated by Venetian *peito*, *fruito*, etc. < PECTV, FRVCTV (*ibid.*, pp. 36-37). It seems that the change -CT- > *[xt] > *[çt] > [jt] appeared at an early stage in the development of Gallo-Romance.

[28] Rumanian intervocalic consonants do not undergo the first (Vulgar Latin) lenition. This process may therefore seem to follow Trajan's reign, or, more accurately, it was probably not completed, in Italy at least, by the time when this emperor's veteran soldiers settled in Dacia. But Gaul and Iberia might have known sonorization earlier.

[29] As a tentative definition, it may be said that traditional philology and phonetics view sound change as an exclusively phonetic type of process (A), "autonomous" phonemics as a B-type process, generative (Postalian) phonemics as C, this functional model as D:



The functional pattern of phonological change D may also be schematized as:

D' / / → [ ] - - - - - - → [ ] ———→ / / (→ [ ] etc.).

A plain arrow symbolizes an exclusively mental relationship and does not involve time. A dotted arrow symbolizes a material development where time is taken into account, but the two (or more) actualizations may coexist as social or geographic variations. The arrows indicating opposite directions in D schematize the hypothesis of a dynamic interplay between sound and phoneme.

[30] Bernard Rochet suggested, in a personal communication, that perhaps the changes that later developed into sound laws originated in such restricted areas as suffixes; hence the study of -ARIV, -ERIV might be

relevant. The possibility of a limited grammatical or lexical extension of a sound change at an early stage has been suggested (cf. above, 4.4, and note 10). It seems, however, that it would not be feasible to study such a development without further philological evidence.

[31] The etymology of *joli* is contested. The standard etymon is Norse *jôl*. G.G. Nicholson, *Recherches philologiques romanes*, suggested the ecclesiastical Latin **diabolivus*. This etymology is considered better than *jôl* by Jacques Cellard," La Beauté du diable" ("La Vie du langage," p. 14). It is accepted here, as it seems satisfactory from both the phonetic and the semantic viewpoints.

[32] *kw*, *k*, etc. here, like [c, cš, etc.] in the channels studied in the preceding pages, signify a point of articulation. The vowels, *i*, *e*, *a*, etc. denote the environment of the cluster under study. Thus at the intersection of *kw* and *i*, there is the potential sequence *kwi*. Early Old Latin had *kwi*, *kwe*, etc., symbolized respectively by 1, 2, etc. As these evolve they no longer represent a particular articulation, but themselves as sound etymons, and their new pronunciation is indicated by their position on the phonological matrix. For example, when, in C, 6 moves into the intersection of *k'* and *i*, that means that the Early Old Latin sound etymon *ki* has become *k'i*. Up to F) 1, the matrix describes the changes supposedly exhibited by both voiceless and voiced articulations; after this, it describes only the changes of the voiceless articulation. Initial voiced articulations do not exhibit the hush > hiss development suggested in F) 1.

[33] The delabialization of *kwa* may have occurred somewhat later than that of *kwi*, *kwe*, since Italian and Walloon have *ki*, *ke*, but *kwa* today. This perhaps points to a slight chronological difference.

[34] Sindou, "Review of L. Michel, *Etude*," p. 154; Martinet, "La Phonologie du mot en danois," p. 204, note 1. Cf. also, Martinet, "*R*, du latin au français d'aujourd'hui," p. 199: "... *s* castillan et danois, *s* qui est presque la norme dans les langues qui n'opposent pas de chuintantes aux sifflantes."

[35] Charles Bruneau, *Enquête linguistique sur les patois d'Ardenne*, p. 45, opposes *balançoire*, *bèrsî* (< BERTIARE), *s sou* (< ECCE HOC), *cièl*, *cinq*, etc. to *chouer* (< SUDARE), *chouale* (< SECALE), *choufler* (< *SVFFILARE), *chourd* (< SVRDV), etc. But the [u] might explain some changes. And at the other extreme, one finds, not far from Ardenne, in Picardy, such irregular forms as *chavatte* (= Sp. *zapata*, It. *ciabatta*), *chucre* (= Sp. *azúcar*, It. *zúcchero*), *chouque* (Fr. *souche*), and it seems to Gossen, who presents these forms (*Petite grammaire de l'ancien picard*), that they are due to confusions dating from the Middle Ages (pp. 90-100).

[36] *Las sibilantes en la Romania*, pp. 127-157. Cf. also Sindou, "Review of L. Michel, *Etude*," p. 158, and Frederick H. Jungemann, *La teoría del sustrato*, pp. 77-78. William J. Entwistle, *The Spanish Language*, suggests that the /ṣ, ẓ/ (< Latin S as against /s, z/ and /ʃ,ʒ/ < Latin palatalized clusters) still found today in Bragança, Tras-os-Montes and Entre-Douro-e-Minho (pp. 285, 302), may attest a stage which was quite general during the Middle Ages (p. 285).

[37] This hypothetical system may have been geographically or socially restricted, like perhaps the /θ/ of Castilian, in its original phase.

[38] See La Prononciation du français contemporain, p. 219, and A Functional View of Language, p. 77.

[39] "On the Mechanism of Linguistic Change," p. 283. Labov specifies that the phonological economy he has examined very carefully--on Martha's Vineyard--seems to operate "in a manner which provides empirical confirmation for the view of linguistic structure expressed by A. Martinet ..." (loc. cit., note 27). For other examples of phonological investigations that seem to confirm this view, see Catalán, "Dialectología," William Moulton, "Structural Dialectology," Luigi Romeo, The Economy of Diphthongization in Early Romance, Uriel Weinreich, "Is a Structural Dialectology Possible?" etc.

CONCLUSIONS

The functional hypotheses presented above constitute an alternative to the various solutions discussed in Chapter Two. Clearly, they are only tentative, and do not have an answer to all questions relative to the Vulgar Latin and Gallo-Romance palatalizations (cf. 4.17). They may appear plausible, however, insofar as they seem to take into account the essential viewpoints relevant to this type of phonological study: philological, historical, phonetic and phonemic. In effect, it may appear that the hypotheses presented in the last chapter, inspired by the principles of linguistic economy, produce a synthesis of data previously thought to conflict, or at least not to converge. The question of the distribution of parasitic i, in particular, which in other accounts is either not studied or accepted as mysterious, seems here solved satisfactorily, and possibly throws some new light on the relative chronology of some Gallo-Romance sound changes. If, finally, some phenomena cannot really be considered "explained" by these functional hypotheses, since these would probably not have been able to predict the changes, perhaps, at least, the reconstructions they suggest appear, on the whole, plausible. Conversely, if they are correct, the image of phonological development that they reflect seems to support the functional view of language change.

A SELECTED BIBLIOGRAPHY

Agroecius, De Orthographia, in Keil, VII, 112-125.

Alarcos Llorach, Emilio. "Derniers travaux récents dans le domaine de la phonétique espagnole," Phonetica 3 (1959), 238-246.

________. Fonología española (según el método de la Escuela de Praga). (4th ed.). Madrid, 1965.

________ "Les représentations graphiques du langage," Le Langage 25 (1968), 513-568.

Alessio, Giovanni. Grammatica storica francese, I: Introduzione-Fonetica. Bari, 1951.

Allen, W. Sidney. "The Latin Accent: A Restatement," Journal of Linguistics 5 (1969), 193-203.

________. "On the Linguistic Study of Language," in P.D. Strevens, ed., Five Inaugural Lectures, Oxford, 1966, 3-26.

________. Phonetics in Ancient India. (2nd ed.). London, 1961.

________. Vox Graeca: A Guide to the Pronunciation of Classical Greek. Cambridge, 1968.

________. Vox Latina: A Guide to the Pronunciation of Classical Latin. London, 1965.

Andersen, H. "A Study in Diachronic Morphophonemics," Language 45 (1969), 807-830.

Anderson, James M. "Repetitions of Phonetic Changes in Spanish," Phonetica 14 (1965), 16-19.

Anttila, Raimo. An Introduction to Historical and Comparative Linguistics. New York and London, 1972.

Arbois de Jubainville, H. d'. "La Phonétique latine de l'époque mérovingienne," Romania 1 (1872), 318-327.

Ascoli, Graziadio I. Corsi de glottologia; vol. 1: Fonologia comparata del sanscrito, del greco e del latino. Turin and Florence, 1870.

________. "Retia, Retiare, Retiaculum," AGI 9 (1886), 102-106.

________. "Saggi ladini, I," AGI 1 (1873), 80-99.

Auctores anonymi. *De Orthographia (Orthographia Bernensis 1)*, in Keil, VIII, 291-295; *De Litteris A*, in Keil, VIII, 302-305; *De Litteris C*, in Keil, VIII, 307-308.

Augustinus. *Ars breviata*, in Keil, V, 490-524.

Avram, Andreĭ. "Contenu et expression au niveau du phonème," *Phonetica* 13 (1965), 18-21.

Bach, Emmon. "Linguistique structurelle et philosophie des sciences" (tr. M.A. Béra), *Diogène* 51 (1965); reprinted in *Problèmes du langage*. Paris, 1966, 117-136.

Bach, Emmon, and Robert Harms, eds. *Universals in Linguistic Theory*. New York, 1968.

Bailey, Charles James N. "Review of J.W.F. Mulder, *Sets and Relations in Phonology*," *Language 46* (1970), 671-687.

Baist, G. "Die kasseler Glossen," *ZRPh* 26 (1902), 101-107.

Bal, Willy. *Introduction aux études de linguistique romane, avec considération spéciale de la linguistique française*. Paris, 1966.

Baldinger, Kurt. "Diskussion aktueller Probleme-Phonologie und traditionelle Sprachwissenschaft. Zu Weinrichs Phonologischen Studien," *ZRPh* (1958), 440-480.

________. "Traditionelle Sprachwissenschaft und historische Phonologie," *ZRPh* 79 (1963), 530-566.

________. "Review of H. Kuen, 'Die Sprachgeographie als Wissenschaft von Menschen,'" *ZRPh* (1963), 594-595.

________. "Review of T.H. Maurer, Jr., *A unidade da Romania ocidental*," *ZRPh* (1958), 294-302.

________. "Review of C. Tagliavini, *Le origini delle lingue neolatine*," *ZRPh* 84 (1970), 672.

________. "Review of W. von Wartburg, *Evolution et structure de la langue française* (5th ed.)," *ZRPh* 74 (1958), 158-161.

Ballard, W.L. "Controversial Speculations on Phonological Complexity," *Linguistics* 70 (1971), 5-15.

Barbeau, Victor. *Le Français du Canada*. Quebec, 1970.

Bar-Hillel, Yehoshua. "On a Misinterpretation of the Status of Theories in Linguistics," *Foundations of Language* 2 (1966), 394-399.

Bartoli, Matteo. "Caratteri fondamentali delle lingue neolatine," *AGI* 28 (1936), 97-138 and 29 (1937), 1-46.

________. *Introduzione alla neolinguistica*. Geneva, 1925.

________. "Per la storia del latino volgare," *AGI* 21 (1927), 5-58.

Battisti, Carlo. *Avviamento allo studio del latino volgare* (4th part: *Fonetica*). Bari, 1950.

Beaulieux, Charles. *Histoire de l'orthographe française: I: Formation de l'orthographe des origines au milieu du XVI^{e} siècle.* Paris, 1927.

Beda. *De Arte metrica. De orthographia*, in Keil, VII, 217-294.

Benveniste, Emile. "Le Langage et l'expérience humaine," *Diogène* 51 (1966), 3-13.

________. *Problèmes de linguistique générale*. Paris, 1966.

________. "Répartition des consonnes et phonologie du mot," *TCLP* 8 (1939), 27-35.

________. "Tendances récentes en linguistique générale," *Journal de Psychologie* (1954), 130-145.

________. "Review of H.M. Hoenigswald, *Language Change and Linguistic Reconstruction*," *BSL* 56 (1961), 26-27.

________. "Review of A. Martinet, *Economie des changements phonétiques*," *BSL* 53 (1957-1958), 42-46.

Beranek, Les L. *Acoustics*. New York, 1954.

Berger, K.W. "An Introduction to Pilipino Phonetics and Pronunciation," *Phonetica* 17 (1967), 24-30.

________. "A Study of Printed Pilipino Usage," *Phonetica* 17 (1967), 31-37.

Bernard, Claude. *Introduction à la médecine expérimentale* (in A. Rebière. *Pages choisies de savants modernes*.) Paris [No date of edition].

Bertoldi, Vittorio. "Arcaismi e innovazioni al margine del dominio celtico," *AGI* 22-23 (1929), 484-541.

Bès, Gabriel G. "Certains aspects du rapport de la phonologie avec la dialectologie," *Phonetica* 13 (1965), 22-26.

Bhat, D.N. Shankara. "Is Sound Change Gradual?," *Linguistics* 42 (1968), 5-18.

________. "The Rate of Language Change," *Linguistics* 39 (1968), 18-20.

Bloch, Oscar. "Review of V. Buben, *Influence de l'orthographe sur la prononciation du français moderne*," *BSL* 37 (1936), 83-85.

———. "Review of G.G. Nicholson, *Recherches philologiques romanes*," *BSL* 23 (1922), 88-89.

———. "Review of M.K. Pope, *From Latin to Modern French*," *BSL* 37 (1936), 82-83.

———. "Review of E. Richter, *Chronologische Phonetik des französischen*," *BSL* 36 (1935), 55-56.

Bloomfield, Leonard. *Language*. New York, 1933.

Bonioli, Maria. *La pronuncia del latino nelle scuole dall'antichità al rinascimento*. Turin, 1962.

Bonnet, Max. *Le Latin de Grégoire de Tours*. Paris, 1890.

Bonnier, Charles. "Etudes critiques des chartes de Douai de 1203 à 1275; Première partie: Recherches sur l'antagonisme des chartes et du langage vulgaire," *ZRPh* 13 (1889), 431-462; Seconde parties: Caractéristiques des chartes de Douai," *ZRPh* 14 (1890), 66-68.

Botha, Rudolf. *The Function of the Lexicon in Transformational Generative Grammar*. The Hague, 1968.

Bourciez, Edouard, *Eléments de linguistique romane*. (5th ed.). Paris, 1967.

———. *Précis historique de phonétique française*. (9th ed. rev. by Jean Bourciez). Paris, 1958.

Bourciez, Edouard, and Jean Bourciez. *Phonétique française, étude historique*. Paris, 1967.

Braune, Th. "Neue Beiträge zur Kenntnis einiger romanischer Wörter deutscher Herkunft," *ZRPh* 22 (1898), 197-216.

Bréal, Michal. "Communication à la Société, 22 février 1890," *BSL* 7 (1888-1892), 64-65.

Breslin, Margaret S. "The Old French Abstract Suffix -*ise*," *RPh* 22 (1968-1969), 408-420.

Brière, Eugene J. *A Psycholinguistic Study of Phonological Interference*. The Hague, 1968.

Bright, William, ed. *Sociolinguistics: Papers of the University of California at Los Angeles Conference on Sociolinguistics (May 1964)*. Paris and The Hague, 1966.

Brøndal, Viggo. *Essais de linguistique générale*. Copenhague, 1943.

________. "Sound and Phonemes," *Proceedings of the Second International Congress of Phonetic Sciences* (1935), 40-45.

________. "The Variable Nature of Umlaut," *Proceedings of the Third International Congress of Phonetic Sciences* (1938), 47-51.

________. *Substrater og laan i romansk og germansk*. Copenhague, 1917.

Brosnahan, L.F. *The Sounds of Language*. Cambridge, 1961.

Brüch, Josef. "Zu: *i* aus *k'* nach *o*, *au* im Französischen," *ZRPh* 38 (1917), 711.

Brun, A. "Linguistique et peuplement. Essai sur la limite entre les parlers d'oıl et les parlers d'oc," *RLiR* 13 (1936), 20-46.

Bruneau, Charles. *Enquête linguistique sur les patois d'Ardenne*. Paris, 1914.

________. "Review of H. Phillips, *Parler de la paroisse Evangéline*," *FM* 5 (1937), 89-93.

Brunot, Ferdinand. *Histoire de la langue française, des origines à 1900*, I and IV, Paris, 1905.

Brunot, Ferdinand and Charles Bruneau. *Précis de grammaire historique de la langue française*. Paris, 1936.

Buben, Vladimir. *Influence de l'orthographe sur la prononciation du français moderne*. Bratislava, 1935.

Buch, Tamara. "La Théorie d'une neutralisation," *La Linguistique* (1969), 73-84.

Budonas, E. *Meléte perì toû glossikoû idiómatos Velvendoû kaì ton perichóron autoû*. Athens, 1892.

Burger, André. "Palatalisation et diphtongaison en roman et en slave," *Romania* 61 (1935), 129-144.

________. "Phonématique et diachronie à propos de la palatalisation des consonnes romanes," *Cahiers F. de Saussure* 13 (1955), 19-33.

Buyssens, Eric. *La Communication et l'articulation linguistique*. Paris, 1967.

Cahen, Claude. "La Leçon de quelques transcriptions arabes de noms français médiévaux," *Romania* 91 (1970), 416-418.

Camilli, Amerindo. *Pronuncia e grafia dell'italiano*. (3rd ed.). Florence, 1965.

Campbell, A. "Review of R.D. King, *Historical Linguistics and Generative Grammar*," *Language* 47 (1971), 204.

Campus, G. *Due note sulla questione delle velari ario-europee*. Turin, 1916.

________. *Sulla questione dell'intacco del c latino*. Turin, 1901.

________. "Le velari latine con speciale riguardo alle testimonianze dei grammatici," *Atti della Reale Accademia delle Scienze di Torino* 54 (1918-1919), 271-284 and 366-376.

Cantineau, Jean. "Essai d'une phonologie de l'hébreu biblique," *BSL* 46 (1950), 88-122.

________. "Review of Z.S. Harris, *Methods in Structural Linguistics*," *BSL* 50 (1954), 4-9.

Capell, A. *Studies in Socio-Linguistics*. The Hague, 1966.

Caper. *De Orthographia*, in Keil, VII, 83-112.

Carnoy, A. *Le Latin d'Espagne d'après les inscriptions*. Bruxelles, 1906.

________. *Restitution des sons en indo-européen et en roman*. Louvain, 1912.

Cartier, Francis A. *The Phonetic Alphabet*. Dubuque, 1954.

Cassiodorus. *De Orthographia: De arte metrica et excerpta*, in Keil, VII, 127-216.

Cassirer, Ernst. "Le Langage et la construction du monde des objets" (translated by P. Guillaume) *Journal de Psychologie* 30 (1933), 18-44.

Castellani, Arrigo. "Fonotipi e fonemi in italiano," *Studi di Filologia Italiana* 14 (1956), 433-453.

Catalán Menéndez Pidal, Diego. "Dialectología y estructuralismo diacrónico," in *Estructuralismo e historia*, III, 69-80.

________ (ed.). *Estructuralismo e historia: Miscelánea homenaje a André Martinet* (3 vols.). Tenerife, 1957-1962.

Cazanave, Marie-Thérèse. "Etude acoustique et articulatoire du YOD français et américain," *Travaux de Linguistique et de Littérature de l'Univ. de Strasbourg* 6 (1968), 235-265.

Cellard, Jacques. "La Beauté du diable," Le Monde "La Vie du langage" (February 14th, 1972); reprinted in *Sélection hebdomadaire du journal "Le Monde"* (February 24th - March 1st, 1972), p. 14.

Cercle Linguistique de Prague. "Principes de transcription phonologique," TCLP 4 (1931), 323-326.

Chafe, Wallace L. "Review of P.M. Postal, Aspects," Language 46 (1969), 116-124.

Charbonneau, Abbé René. La Palatalisation de t/d en canadien français. Montreal, 1955.

Charisius, Flavius S. Artis grammaticae, Libri V, in Keil, I, 1-296.

Chatterji, S.K. "Evolution in Speech Sounds," Proceedings of the Third International Congress of Phonetic Sciences (1938), 332-344.

Cheng, Robert L. "Mandarin Phonological Structure," Journal of Linguistics 2 (1966), 135-158.

Chlumský, Josef. Radiografie Francouských Samohlásek a Polosamohlásek. Prague, 1938.

Chomsky, Noam, and Morris Halle. "Some Controversial Questions in Phonological Theory," Journal of Linguistics 1 (1965), 97-138.

________. The Sound Pattern of English. New York, 1968.

Cledonius, Ars, in Keil, V, 9-79.

Cohen, L. Jonathan. "Review of Jerrold J. Katz. The Philosophy of Language," Journal of Linguistics 3 (1967), 163-165.

Colpron, Gilles. Les Anglicismes au Québec. Montreal, 1970.

Commentum Einsidlense in Donati Artem Maiorem, in Keil, VII, 201-274.

Consentius. Ars, in Keil, V, 329-404.

Corbett, Noel. "Review Article: Luigi Romeo. The Economy of Diphthongization in Early Romance," RPh 24 (1970), 273-290.

Creore, JoAnn. "Synchronic Grammars, Reconstruction, and the Selection Problem," The Canadian Journal of Linguistics 17 (1971), 16-26.

Cuny, A. "Les Spirantes palatales et vélaires dans la vallée de la Meurthe," RLaR 49 (1906), 521-536.

________. "Review of A. Dauzat, Géographie phonétique d'une région de la Basse-Auvergne," BSL 14-15 (1905-1908), 263-265.

Darmesteter, Arsène. Cours de grammaire historique de la langue française, I: Phonétique. (3rd. ed.). Paris, 1930.

________. "Review of C. Joret, Du C dans les langues romanes," Romania 3 (1874), 379-398.

Dauzat, Albert. *Essai de méthodologie linguistique dans la domaine des langues et des patois romans*. Paris, 1906.

________. "Géographie phonétique de la Basse-Auvergne," *RLiR* 14 (1938), 1-210.

________. *Géographie phonétique d'une région de la Basse-Auvergne*. Paris, 1906.

________. "Notes sur la palatalisation des consonnes," *Romania* 42 (1913), 23-33.

________. *Phonétique et grammaire historique de la langue française*. Paris, 1950.

________. "Les Sous-produits de C (+ A latin) dans la Gaule romane," *Revue de Philologie Française* 39; 40.

________. "Le Substrat germanique dans l'évolution phonétique du français," *Mélanges Jacobus van Ginneken*, Paris, 1937, 267-272.

________. *Tableau de la langue française*. (2nd ed.). Paris, 1967.

Delattre, Pierre. "From Acoustic Cues to Distinctive Features," *Phonetica* 18 (1968), 198-230.

________. "Les Indices acoustiques de la parole: premier rapport," *Phonetica* 2 (1958), 108-118; 226-251.

________. *Studies in French and Comparative Phonetics*. The Hague, 1966.

________. "La Théorie celtique et les substrats," *RPh* 23 (1969-1970), 480-491.

Deloche, M. *Renseignements archéologiques sur la transformation du C guttural du latin en une sifflante*. *Mémoire de l'Académie des Inscriptions et Belles-Lettres* 30, 2nd part, 1884.

Densusianu, Ovid. "Sur l'altération du *C* latin devant *e*, *i* dans les langues romanes," *Romania* 20 (1900), 321-333.

________. *Histoire de la langue roumaine*. Paris, 1901.

________. "Review of P. Meyer, 'Die Aussprache des c und t im klassischen Latein," *Romania* 33 (1904), 99-101.

Diderot, Denis. *Le Neveu de Rameau, suivi de six oeuvres philosophiques*. Paris, 1966.

Diez, Friedrich. *Grammaire des langues romanes*, I (tr. Auguste Brachet, Gaston Paris, and A. Morel-Fatio), Paris, 1874.

Diomedes. *Artis grammaticae, libri III*, in Keil, I, 297-529.

Donatus. Ars grammatica, in Keil, IV, 353-402.

Dorfman, Eugene. "Correlation and Core-Relation in Diachronic Romance Phonology," Word 24 (1968), 81-98.

Dorveaux, P. "Ancien provençal NOTZ YSSERCA, NOT YCHERCA, etc." Romania 43 (1914), 241-243.

Dottin, Georges. La Langue gauloise. Paris, 1918.

Duraffour, Antonin. "Phénomènes généraux d'évolution phonétique dans les dialectes franco-provençaux étudiés d'après le parler de la commune de Vaux (Ain)," RLiR 8 (1932), 1-261.

Durand, Marguerite. "Assourdissement des consonnes dans les groupes français," Journal de Psychologie 40 (1947), 484-490.

________. "La Palatalisation en anglais," Mélanges Fernand Mossé, Paris, 1959, 113-121.

________. "La Palatalisation des consonnes. L'exemple de l'anglais," Journal de Psychologie 55 (1958), 172-183.

________. "Du Rôle de l'auditeur dans la formation des sons du langage," Journal de Psychologie 52 (1955), 347-355.

Durante, Marcello. "Le sibilanti dell'etrusco," Studi linguistici in onore di Vittore Pisani, Brescia, 1969, 295-306.

Einstein, Albert. Albert Einstein Philosopher-Scientist. New York, 1949.

Elcock, William D. The Romance Languages. London, 1960.

Entwistle, William J. The Spanish Language, Together with Portuguese, Catalan and Basque (2nd ed.). London, 1969.

Ernout, Alfred. Review of V. Väänänen, Le Latin vulgaire des inscriptions pompéiennes," BSL 39 (1938), 69-70.

Eutyches. Ars de verbo, in Keil, V, 442-489.

Ewert, Alfred. The French Language. London, 1933.

Falc'hun, Chanoine François. Le Système consonantique du breton. Rennes, 1951.

Förster, W. "Die reichenauer Glossen," ZRPh 31 (1907), 513-568.

Ford, J.D.M. The Old Spanish Sibilants. Boston, 1900.

Francescato, Giuseppe. "Il sistema dei suoni sibilanti nel dominio friulano," RLiR 26 (1962), 51-70.

________. "Review of Noam Chomsky. Syntactic Structures," AGI 43 (1958), 66-69.

________. "Structural Comparison, Diasystems and Dialectology," ZRPh 81 (1965), 484-491.

________. "Les Unités phonologiques dans la perspective diachronique," Festschrift Walther von Wartburg (1968), 451-465.

Frings, Theodor. "Franzosisch und Frankisch," ZRPh 58 (1938), 257; ZRPh 63 (1943), 174-178.

Frings, Theodor, and Walther von Wartburg. "Französisch und Fränkisch," ZRPh 57 (1937), 193-210.

________. "Germanisch-Romanisches. Französisch-Fränkisches," ZRPh 70 (1954), 86-97.

Galmés de Fuentes, Alvaro. Las sibilantes en la Romania. Madrid, 1962.

Gamillscheg, Ernst. "Zur Geschichte der Assibilierung und der Palatalisierung," Festschrift Walther von Wartburg, Tubingen, 1968, 445-450.

Gauchat, Louis. "Le Patois de Dompierre (Broyard)," ZRPh 14 (1890), 397-466.

Gendron, Jean-Denis. Tendances phonétiques du français parlé au Canada. Paris, 1966.

Gilliéron, Jules. Généalogie des mots qui désignent l'abeille d'après l'ALF, Paris, 1918.

________. Pathologie et thérapeutique verbales. Neuveville, 1915.

Gilliéron, Jules, and Mario Roques. Etudes de géographie linguistique. Paris, 1912.

Ginneken, Pater Jacobus van. "La Biologie de la base d'articulation," Journal de Psychologie 30 (1933), 266-320.

________. De Oorzaken der taalveranderingen. (2nd ed.). Amsterdam, 1930.

________. De Ontwikkelingsgeschiedenis van de systemen der menschelijke taalklanken. Amsterdam, 1932.

________. Principes de linguistique psicologique. Amsterdam and Paris, 1907.

________. Ras en taal. Amsterdam, 1935.

________. La Reconstruction typologique des langues archaïques de l'humanité. Amsterdam, 1939.

Goidànich, P.G. "Le alterazioni fonetiche del linguaggio e le loro cause. Delle leggi fonetiche," *AGI* 20 (1926), 3-59.

________. "Per la fisiologia delle rattratte *ćčc*," *Miscellanea Hortis* 2 (1910), 929-945.

Gorce, M.M. *Clovis*. Paris, 1925.

Gossen, Charles-Théodore. "L'Interprétation des graphèmes et la phonétique historique de la langue française," *Travaux de Linguistique et Littérature de l'Univ. de Strasbourg* 6 (1968), 149-168.

________. *Petite grammaire de l'ancien picard*. (2nd. ed.). Paris, 1970.

Grammont, Maurice. "Note sur l'article d'Ascoli, 'Ancora della sibilante tra vocali nel toscano;'" *RLaR* 45 (1902), 335.

________. "Notes de phonétique générale," *BSL* 24 (1923), 1-109.

________. *Phonétique du grec ancien*. Lyon, 1948.

________. *Traité de phonétique*. Paris, 1933.

________. "Review of V. Brøndal, *Substrater og laan i romansk og germansk*," *RLaR* 60 (1918-1920), 118-120.

________. "Review of F. Brunot, *Histoire de la langue française, I*," *RLaR* 54 (1911), 92-99.

Grandgent, Charles H. *From Latin to Italian*. Cambridge, 1940.

Graur, Alexandru. *I et V en latin*, Paris, 1929.

________. "TS en latin," *Romania* 56 (1930), 265-267.

Grégoire, Antoine. "La Palatalisation du ch et du j français," *FM* 19 (1951), 21-22.

Guarnerio, Pier Enea. *Fonologia romanza*. Milan, 1918.

________. "L'intacco latino della gutturale di CE, CI," *AGI* (suppl) 4, 21-51.

Guiraud, Pierre. "Emprunts et équilibre phonologique," *ZRPh* 74 (1958), 78-88.

________. *Patois et dialectes français*. Paris, 1968.

________. "Les Structures aléatoires de la double articulation," *BSL* 38 (1963), 135-155.

Haadsma, R.A., and Nuchelmans, J. *Précis de latin vulgaire*, Groningen, 1963.

Haden, Ernest F. *The Physiology of French Consonant Changes: A Study in Experimental Phonetics*. Baltimore, 1938.

Hadlich, Roger. *The Phonological History of Vegliote*. Chapel Hill, 1965.

Hagège, Claude. "Phonologie," in A. Martinet, *La Linguistique*, 298-304.

Hála, Bohuslav, and B. Polland. *Artikulace Ceských Zvuku v Roentgenových Obrazech (Skiagramech)*. Prague, 1926.

Halle, Morris. "Is Kabardian a Vowel-less Language?" *Foundations of Language* 6 (1970), 95-103.

Harris, Zellig S. *Methods in Structural Linguistics*. Chicago, 1951.

Hatzfeld, Adolphe, and Arsène Darmesteter. *Dictionnaire général de la langue française du commencement du XVII*^{e} *siècle à nos jours, précédé d'un traité de la formation de la langue*, I (9th ed.). Paris, 1932.

Haudricourt, André G. "Méthode pour obtenir des lois concrètes en linguistique générale," *BSL* 41 (1940), 70-74.

________. "Phonologisation du R sourd en français," *BSL* 48 (1952), 84-85.

________. "Quelques principes de phonologie historique," *TCLP* 8 (1939), 270-272.

________. "Review of J. Horecky, Fonologia latinciny," *BSL* 46 (1950), 89.

________. "Review of M. Philipp, *Le Système phonologique du parler de Blaesheim*," *BSL* 62 (1967), 69-70.

Haudricourt, André G., and Alphonse G. Juilland. *Essai pour une histoire structurale du phonétisme français*. (2nd ed. rev.). The Hague, 1970.

Haudricourt, André G., and André Martinet. "Propagation phonétique ou évolution phonologique? Assourdissement et sonorisation d'occlusives dans l'Asie du sud-est," *BSL* 43 (1946), 82-92.

Havránek, Bohuslav. "Ein phonologischer Beitrag zur Entwicklung der slavischen Palatalreihen," *TCLP* 8 (1939), 327-334.

Hegedüs, Ludwig. "Neuere Untersuchungen über die ungarischen Affrikaten," *Phonetica* 2 (1958), 153-183.

Herman, Joseph. "Aspects de la différenciation territoriale du latin sous l'empire," *BSL* 60 (1965), 53-70.

________. *Le Latin vulgaire*. Paris, 1967.

________. "Review of E. and J. Bourciez, *Phonétique française, étude historique*," *BSL* 63 (1968), 79-82.

________. "Review of W. von Wartburg, *La Fragmentation linguistique de la Romania*," *BSL* 63 (1968), 74-75.

Herzog, E. "Review of E. Bourciez, *Précis historique de phonétique française*," *ZRPh* 26 (1902), 359-360.

Hirschfeld, O. *Corpus Inscriptionum Latinarum* [CIL, XII]: *Galliae Narbonensis*, Berlin, 1888.

Hirschfeld, O., and Carolus Zangemeister. *Corpus Inscriptionum Latinarum*, XII: *Aquitaniae et Lugudunensis*, Berlin, 1899.

Hockett, Charles F. *A Course in Modern Linguistics*. New York, 1958.

________. *A Manual of Phonology*. Baltimore, 1955.

________. *The State of the Art*. The Hague and Paris, 1968.

Hoenigswald, Henry M. "Diachronic Sound Charts: A Technique to Represent Sound Change," *Studies in Linguistics* 6 (1948), 81-94.

________. *Language Change and Linguistic Reconstruction*. Chicago, 1960.

Hofmann, J.B. *Etymologisches Wörterbuch des Griechischen*. Munich, 1950.

Horeck[illegible] Jan. *Fonologia latinciny* (Résumé in French), Bratislava, 1949.

Horning, Adolf. "Zur Behandlung von Ci̯ and Ti̯," *ZRPh* 25 (1901), 736-737.

________. "Zur Behandlung von *Ty* in Französischen," *ZRPh* 18 (1894), 232-242.

________. "Zur Behandlung von 'Ty' und 'Cy,'" *ZRPh* 24 (1900), 545-555.

________. "Fraise. Framboise," *ZRPh* 28 (1904), 513-534.

________. *Zur Geschichte des lateinischen c vor e und i im Romanischen*. Halle, 1883.

________. "Zur Kunde des Neuwallonischen," *ZRPh* 9 (1885), 480-496.

________. "Zur Lautgeschichte der ostfranzösischen Mundarten," *ZRPh* 14 (1890), 376-396.

________. "Zur Lautlehre. Die betonten Hiatusvokale im Vulgärlatein," *ZRPh* 25 (1901), 341-344.

________. "Zur *Ti̯* - Frage im Französischen," *ZRPh* 31 (1907), 200-219.

________. "Wandel von *s* for Konsonant zu *y* in Frankreich," *ZRPh* 23 (1899), 572-573.

________. "Review of O. Siemt, *Ueber lateinsiches C vor E und I im Pikardischen*," *ZRPh* 7 (1883), 163-164.

Hubschmid, Johannes. "Wörter mit *S-/Z-, TŠ* im Romanischen, Baskischen und andern Sprachen," *RLiR* 27 (1963), 364-448.

Hyman, Larry M. "How Concrete is Phonology?," *Language* 46 (1970), 58-76.

Iordan, Iorgu. "Lateinisches ci̯ und ti̯ im Süditalienischen," *ZRPh* 42 (1922), 641-685.

Iordan, Iorgu, and John Orr. *An Introduction to Romance Linguistics* (2nd ed. rev. by Rebecca Posner), Oxford, 1970.

Isidorus of Seville. *Origines*, quoted by Karl Mras. 'Assibilierung,' pp. 89-92.

Jakobson, Roman, Gunnar M. Fant and Morris Halle. *Preliminaries to Speech Analysis* (7th ed.). Cambridge, 1967.

Jeanneret, Maurice. *La Langue des tablettes d'exécration latines*. Paris and Neuchatel, 1918.

Jespersen, Otto. *Mankind, Nation, and Individual*. London, 1946.

Jones, David. *The History and Meaning of the Term "Phoneme*." London, 1957.

________. *The Phoneme: Its Nature and Use*. (2nd ed.). Cambridge, 1962.

Joos, Martin, ed. *Readings in Linguistics* (2nd ed.). New York, 1958.

Joret, Charles. *Du C dans les langues romanes*, Paris, 1874.

________. *Des Caractères et de l'extension des patois normands. Etude de phonétique et d'ethnographie*. Paris, 1883.

________. "DI = J," *Romania* 12 (1883), 591.

________. "De Quelques modifications phonétiques particulières au dialecte bas-normand," *Romania* 5 (1876), 490-493.

Jud, Jacob. "Mots allemands d'origine romane," *Romania* 42 (1913), 581-582.

________. "Review of M. Jeanneret, *La Langue des tablettes d'exécration latines*," *Romania* 45 (1918-1919), 549-552.

________. "Review of A. Levi, *Le palatali piemontesi*," *Romania* 45 (1918-1919), 278-283.

________. "Review of H. Schuchardt, *Die romanischen Lehnwörter im Berberischen*," *Romania* 45 (1918-1919), 272-275.

Jungemann, Frederick H. *La teoría del sustrato y los dialectos hispano-romances y gascones* (tr. Emilio Alarcos Llorach). Madrid, 1955.

Juret, A.C. *Manuel de phonétique latine*. Paris, 1921.

Kaspers, Wilhelm. "Zur Palatalisierung des lat. *C*," *ZRPh* 42 (1922), 494-496.

Katz, Jerrold J. *The Philosophy of Language.* New York, 1966.

Keil, Heinrich. *Grammatici latini ex recensione H. Keilii* (8 vols.). Leipsig, 1858-1870.

Keiler, Allan R. *A Reader in Historical and Comparative Linguistics*. New York, 1972.

King, Robert D. "Functional Load and Sound Change," *Language* 43 (1967), 846-853.

________. *Historical Linguistics and Generative Grammar*. Englewood Cliffs, 1969.

________. "Push Chains and Drag Chains," *Glossa* 3 (1969), 3-21.

Koschwitz, Eduard. *Commentar zu den ältesten französischen Sprachdenkmälern*. Heilbronn, 1886.

Labhardt, André. "Review of G. Rohlfs, *Sermo vulgaris latinus*," *ZRPh* 71 (1955), 91-92.

________. "Review of V. Väänänen, *Le Latin vulgaire des inscriptions pompéiennes*," *ZRPh* 61 (1941), 355-360.

Labov, William. "On the Mechanism of Linguistic Change," in Allan R. Keiler, *A Reader in ... Linguistics*, 267-288.

________. "The Study of Language in Its Social Context," *Studium Generale* 23 (1970), 30-87.

Lakatos, I. "Proofs and Refutation," *The British Journal for the Philosophy of Science* 14 (1963), 1-25, 120-176, 221-264.

Lausberg, Heinrich. *Romanische Sprachwissenschaft*. (2 vols.) Berlin, 1956.

Lehmann, Winfred P. "Review of Yakov Malkiel. *Essays on Linguistic Themes*," *Foundations of Language* 8 (1972), 280-287.

Lehmann, Winfred P., and Yakov Malkiel, eds. *Directions for Historical Linguistics*. Austin, 1968.

Lenz, Rudolf. "Zur Physiologie und Geschichte der Palatalen," *Zeitschrift fur vergleichende Sprachforschung* 29 (1888), 1-59.

Lenz, Rodolfo, Andrés Bello, and Rodolfo Oroz. *El español en Chile*. Buenos Aires, 1940.

Leumann, Manu. "Grieschischen Verben auf -ιζειν im Latein," *Mélanges Jules Marouzeau*, Paris, 1948, 371-389.

Levi, Attilio. *Le palatali piemontesi*. Turin, 1918.

Liiv, Georg. "Preliminary Remarks on the Acoustic Cues for Palatalization in Estonian," *Phonetica* 13 (1965), 59-64.

Lindström, P.E. *Die Palatale der lateinischen Lehnwörter im Althochdeutschen*. Stockholm and Lund, 1895.

Livingston, Charles H. "Two Anglo-French Etymologies," *RPh* 15 (1961-1962), 269-273.

Lloyd, J., and A. Healey. "Barua Phonemes: A Problem in Interpretation," *Linguistics* 60 (1970), 33-48.

Locke, William N. *Pronunciation of the French Spoken at Brunswick (Maine)*. Cambridge, 1941.

Löfstedt, Bengt. "Review of M. Bonioli. *La pronuncia del latino nelle scuole dall'antichità al rinascimento*," *ZRPh* 81 (1965), 168-171.

Longus, Velius. *De Orthographia*, in Keil, VII, 37-81.

Lot, Ferdinand. "Le Dialecte roman des *Serments de Strasbourg*," *Romania* 65 (1939), 145-163.

________. *La Gaule*. Paris, 1947.

________. *Les Invasions germaniques, La pénétration mutuelle du monde barbare et du monde romain*, Paris, 1935.

________. "Pour la chronologie des modifications phonétiques," *Romania* 45 (1918-1919), 498-500.

Lücking, Gustav. *Die ältesten französischen Mundarten. Eine sprachgeschichtliche Untersuchung von Gustav Lücking*. Berlin, 1877.

Lüdtke, Helmut. "Considérations sur la théorie phonétique," *La Linguistique* 7 (1971-1972), 139-143.

________. "Deutsche /x/ and /ç/ in diachronische-phonologischer Betrachtung," *Phonetica* 4 (1959), 178-183.

________. *Die strukturelle Entwicklung des romanischen Vokalismus*, Bonn, 1956.

Lutta, C.M. Der Dialekt von Bergün (Beihefte zur ZRPh). Halle, 1923.

Lyon, Ardon. "Causality," The British Journal for the Philosophy of Science 18 (1968), 1-20.

Madonia, Giovanna. "Economie," in A. Martinet, La Linguistique, 81-86.

Malkiel, Yakov. "Each Word Has a History of Its Own," Glossa (1967), 137-149.

________. "Economie phonologique et pertes lexicales," Mélanges Maurice Delbouille, I, 409-416.

________. Essays on Linguistic Themes. Berkeley, 1968.

________. "The Inflectional Paradigm As an Occasional Determinant of Sound Change," in Lehmann, Winfred P., and Malkiel, Yakov, eds. Directions for Historical Linguistics.

________. "The Interlocking of Narrow Sound Change, Broad Phonological Pattern, Level of Transmission, Areal Configuration, Sound Symbolism, Diachronic Studies in the Hispano-Romance Consonant Clusters cl-, fl-, pl-," Archivum Linguisticum 15 (1962), 143-173; 16 (1963), 1-33.

________. "Language History and Historical Linguistics," RPh 7 (1953-1954), 65-76.

________. "The Pattern of Progress in Romance Linguistics," RPh 5 (1951-1952), 278-295.

________. "Range of Variation As a Clue to Dating," RPh 21 (1967-1968), 461-501.

________. "Review of A. Martinet, Economie des changements phonétiques," RPh 10 (1956-1957), 350-362.

Malmberg, Bertil. "Couches primitives de structure phonologique," Phonetica 11 (1964), 221-227.

________. "Description synchronique et état de langue. A propos du vocalisme français," Phonétique et linguistique romanes. Mélanges Georges Straka, I, 1970, 223-229.

________. L'Espagnol dans le Nouveau Monde. Lund, 1948.

________. "Hierba/Yerba en Argentina," Mélanges Maurice Delbouille, I, 417-420.

________. "Linguistique ibérique et ibéro-romane," Studia Linguistica 15 (1961), 57-113.

________. "La Linguistique structurale et la phonétique expérimentale," Acta Conventus Romani, Rome, 1959, 67-85.

________. "Note sur l'articulation du (s) et le traitement de l'affriquée (ts) en roman occidental," *Omagiu lui Iorgu Iordan*, 1958, 543-545.

________. *Phonetics* (tr. Lily M. Parker, and Bertil Malmberg). New York, 1963.

________. *Système et méthode: Trois études de linguistique générale*. Lund, 1945.

Mańczak, Witold. "Quelques Réflexions sur la doctrine de Noam Chomsky," *Linguistics* 49 (1969), 18-27.

Maniet, A. "Le Substrat celtique dans les langues romanes. Les problèmes et la méthode," *Travaux de Linguistique et Littérature de l'Univ. de Strasbourg*, 1 (1963), 195-200.

Marchot, Paul. *Petite phonétique du français prélittéraire*. (2 vols.). Fribourg, 1901.

________. "Zur Wortgeschichte: Solution de la question du suffixe -arius," *ZRPh* 17 (1893), 288-292.

Maréchal, Alphonse. *La Wallonie et ses régions linguistiques*. Liege, 1926.

Marouzeau, Jules. *Lexique de la terminologie linguistique* (3rd ed.). Paris, 1969.

Martinet, André. *La Description phonologique, avec application au parler franco-provençal d'Hauteville* (*Savoie*). Genève, 1955.

________. "Diffusion of Language and Structural Linguistics," *RPh* 6 (1952-1953), 5-13.

________. *Economie des changements phonétiques: Traité de phonologie diachronique*. Bern, 1955.

________. *Eléments de linguistique générale*. Paris, 1960.

________. "Equilibre et instabilitié des systèmes phonologiques," *Proceedings of the 3rd International Congress of Phonetic Sciences*, (1939), 30-35.

________. *A Functional View of Language*. Oxford, 1962.

________. "Indétermination phonologique et diachronie," *Phonetica* 12 (1965), 13-18.

________. *La Linguistique: guide alphabétique*. (Sous la direction d'A. Martinet), Paris, 1969.

________. "Le Mot," *Diogène* 51 (1966), 39-53.

________. "Neutralisation et archiphonème," *TCLP* 6 (1936), 46-57.

________. "Neutralisation et syncrétisme," La Linguistique 1 (1968), 1-20.

________. "La Palatalisation 'spontanée' de G en arabe," BSL 54 (1959), 90-102.

________. "Phonologie et 'laryngales,'" Phonetica 1 (1957), 8-30.

________. "La Phonologie du mot en danois," BSL 38 (1937), 169-266.

________. "A Project of Transliteration of Classical Greek," Word 9 (1953), 152-161.

________. La Prononciation du français contemporain. Paris, 1945.

________. "R, du latin au français d'aujourd'hui," Phonetica 8 (1962), 193-202.

________. "Réalisations identiques de phonèmes différents," La Linguistique 2 (1969), 127-130.

________. "Remarques sur le consonantisme sémitique," BSL 49 (1953), 67-78.

________. "Rôle de la corrélation dans la phonologie diachronique," TCLP 8 (1939), 273-288.

________. "Substance phonique et traits distinctifs," BSL 53 (1957-1958), 72-85.

________. "Review of G. Alessio, Grammatica storica francese," Word 9 (1953), 174-177.

________. "Review of R. Charbonneau, La Palatalisation de t/d en canadien-français," BSL 52 (1956), 102-103.

________. "Review of N.S. Trubetzkoy, Grundzüge der Phonologie," BSL 42 (1945), 23-33.

________. "Review of N. van Wijk, Phonologie, een hoofdstuk uit de structurele taalwetenschap," BSL 42 (1945), 33-35.

Maublanc, M., aîné. De l'Existence du genre neutre dans la langue francaise considérée comme un nouveau moyen de parvenir à l'analyse du langage. Nantes, 1814.

Maurus, Terentius. De Litteris, de syllabis, de metris, in Keil, VI, 313-413.

McDavid, Raven I. "Burmese Phonemics," Studies in Linguistics 3 (1945), 6-18.

McElhanon, K.A. "Stops and Fricatives: Non-Unique Solution in Selepet," Linguistics 60 (1970), 49-62.

Meillet, Antoine. Esquisse d'une histoire de la langue latine (3rd ed.). Paris, 1933.

________. *Introduction à l'étude comparative des langues indo-européennes* (8th ed.). Paris, 1937.

________. "Les Langues romanes et les tendances des langues indo-européennes," *RLiR* 1 (1925), 1-8.

________. *Linguistique historique et linguistique générale*. Paris, 1926.

________. *La Méthode comparative en linguistique historique*. Paris, 1925.

________. "Sur le bilinguisme," *Journal de Psychologie* 30 (1933), 167-171.

________. "Review of C. Beaulieux, *Histoire de l'orthographe* française, I." *BSL* 28 (1928), 154-155.

________. "Review of E. Bourciez, *Eléments de linguistique romane*," *BSL* 24 (1923), 77-80.

________. "Review of H. Barić, *Indoevrepski palatali*," *BSL* 29 (1929), 70-71.

________. "Review of M. Bartoli, *Introduzione alla neolinguistica*," *BSL* 28 (1928), 4-10.

________. "Review of V. Brøndal, *Substrater og laan i romansk og germansk*," *BSL* 21 (1918), 38-41.

________. "Review of F. Brunot, *Histoire de la langue française, tome IV,2, La Langue postclassique* (by A. François)," *BSL* 33 (1932), 78-81.

________. "Review of G. Campus, 'Le velari latine con speciale riguardo alle testimonianze dei grammatici,'" *BSL* 21 (1918), 221-222.

________. "Review of A. Carnoy, *Restitution des sons en indo-européen et en roman*," *BSL* 19 (1914), 36-37.

________. "Review of G. Dottin, *La Langue gauloise*," *BSL* 22 (1921), 89-91.

________. "Review of J. van Ginneken, *De Oorzaken der taalveranderingen*," *BSL* 26 (1925), 22-25, and 31 (1931), 16-17.

________. "Review of M. Grammont, *Traité de phonétique*," *BSL* 34 (1933), 2-6.

________. "Review of C.H. Grandgent, *Introducción al latin vulgar*," *BSL* 30 (1930), 114-116.

———. "Review of A. Graur, *I et V en latin*," *BSL* 31 (1931), 98-101.

———. "Review of P.E. Guarnerio, *Fonologia romanza*," *BSL* 21 (1918), 228-230.

———. "Review of M. Leumann and J.B. Hofmann, 5th ed. rev. of Stolz-Schmalz, *Lateinische Grammatik*," *BSL* 27 (1927), 61-70.

———. "Review of F. Lot, *Les Invasions germaniques*," *BSL* 36 (1935), 49.

———. "Review of H.F. Muller, *A Chronology of Vulgar Latin*," *BSL* 31 (1931), 108-112.

———. "Review of K. Ringenson, *Etude sur la palatalisation de k devant une voyelle antérieure en français*," *BSL* 23 (1922), 80-81.

———. "Review of E. Sapir, 'La Réalité psychologique des phonèmes,'" *BSL* 34 (1933), 20-26.

———. "Review of H. Schuchardt, *Der Individualismus in der Sprachforschung*," *BSL* 27 (1927), 12-13.

———. "Review of F. Ventura, *La teoria ascoliana sulle velari indo-europee primitive*," *BSL* 27 (1927), 39.

———. "Review of W. von Wartburg, *Evolution et structure de la langue française*," *BSL* 35 (1935), 82-85.

Meillet, Antoine, and Joseph Vendryes. *Traité de grammaire comparée des langues classiques* (2nd ed.). Paris, 1937.

Menéndez Pidal, Ramón. *Manual elemental de gramática histórica española* (5th ed.). Madrid, 1929.

———. *Orígenes del español* (3rd ed.). Madrid, 1950.

Merlo, Clemente. "Ancora di L palatalizzata nei dialetti della campagna romana," *ZRPh* 33 (1909), 85-88.

Meyer, Paul. "Die Aussprache des *c* und *t* im klassichen Latein," *32-stes Jahresheft des Vereins schweizer Gymnasiallehrer* (1902), 44-80.

———. "*C* et *G* suivis d'*A* en provençal. Etude de géographie linguistique," *Romania* 24 (1895), 529-575.

Meyer, Wilhelm. "Zur Lautlehre: ci̯ ti̯ im Italienischen," *ZRPh* 8 (1884), 302-304.

Meyer-Lübke, Wilhelm. "Beiträge zur romanischen Laut- und Formenlehre," *ZRPh* 39 (1919), 257-266; 40 (1920), 62-82; 41 (1921), 555-565; 45 (1925), 641-661.

________. *Einführung in das Studium der romanischen Sprachwissenschaft.* (3rd ed.). Heidelberg, 1920.

________. "Gallische Lenition in Galloromanischen?" *ZRPh* 42 (1922), 332-336.

________. "Zur galloromanischen Sprachgeschichte," *ZRPh* 47, 1927, 287-292.

________. "Zur Geschichte des *c* vor hellen Vokalen," *Bausteine zur romanischen Philologie*. *Festgabe für Adolfo Mussafia*, Halle 1905, 313-320.

________. *Grammaire des langues romanes: I: Phonétique* (tr. Eugène Rabiet), Paris, 1890.

________. "Ital. *uscio*, frz. *huis*," *ZRPh* 25 (1901), 355-358.

________. "Ngr.-έρι = Vulglat. -eriu = kl.Lat. -ariu?" *ZRPh* 22 (1898), 1-2.

________. "Review of K. Ringenson, *Etude sur la palatalisation de k devant une voyelle antérieure en français*," *ZRPh* 44 (1924), 350-356.

Michel, Louis. *Etude du son "s" en latin et en roman*. *Des origines aux langues romanes: De la phonétique au style*. Paris, 1950.

Migliorini, Bruno. "L'intacco della velare nelle parlate romanze," *Silloge linguistica dedicata alla memoria di G.I. Ascoli nel primo centenario della nascita*, Turin, 1929, 271-301.

________. *The Italian Language*. London, 1966; tr. *Storia della lingua italiana*, Florence, 1960.

Mignot, Xavier. "Un Cas d'adaptation phonétique: le suffixe grec -ίζω en latin," *Word* 24 (1968), 290-294.

Millardet, Georges. "Dentales et dentition dans les Landes, Essai de Phonétique et physiologie comparées," *Journal de Psychologie* 32 (1935), 338-354.

________. "Linguistique et dialectologie romanes: 2e partie. -Le problème phonétique," *RLaR* 61 (1921), 193-368.

________. "Review of E. Bourciez, *Précis historique de phonétique française*," *RLaR* 63 (1925), 370-372.

________. "Review of A. Levi, *Le palati piemontesi*," *RLaR* 60 (1918-1920), 157-159.

Mirambel, André. "Du Caractère des chuintantes dans certains parlers néohelléniques," *BSL* 48 (1952), 63-78.

________. "Le Groupe *ts* en grec moderne," *BSL* 42 (1945), 89-102.

________. "Review of E. Benveniste, *Problèmes de linguistique générale*," *BSL* 63 (1968), 16-18.

________. "Review of E. Benveniste, 'Tendances récentes en linguistique générale,'" *BSL* 50 (1954), 10-14.

Mohl, François-Georges. *Introduction à la chronologie du latin vulgaire*. Paris, 1899.

________. "Review of W. Meyer-Lübke, *Einführung in das Studium der romanischen Sprachwissenschaft*," *ZRPh* 26 (1902), 593-620.

Morciniek, Norbert. "Fremdphoneme in der niederländischen Hochsprache," *Phonetica* 16 (1967), 205-214.

Moulton, William G. "Dialect Geography and the Concept of Phonological Space," *Word* 18 (1962), 23-32.

________. "The Short Vowel System of Northern Switzerland," *Word* 16 (1960), 155-182.

________. "Structural Dialectology," *Language* 44 (1968), 451-466.

Mounin, Georges. "A propos de 'Language, Thought and Reality' de Benjamin L. Whorf," *BSL* 56 (1961), 121-138.

________. *Clés pour la linguistique*. Paris, 1968.

________. *Histoire de la linguistique des origines au XX^{e} siècle*. Paris, 1967.

Mras, Karl. "Assibilierung und Palatalisierung in späteren Latein," *Wiener Studien* 63 (1948), 86-101.

Muljačić, Žarko. *Fonologia generale e fonologia della lingua italiana*, Bologna, 1969.

Muller, Henri-François. *A Chronology of Vulgar Latin*. Halle, 1929.

________. *L'Epoque mérovingienne: Essai de synthèse de philologie et d'histoire*. New York, 1945.

________. "On the Use of the Expression *Lingua Romana* From the First to the Ninth Century," *ZRPh* 43 (1923), 9-19.

________. "Review of A. Ewert, The French Language," ZRPh 57 (1937), 105-107.

Munot, Philippe. "A propos de ce qui est linguistique dans l'étude du langage," FM 33 (1965), 271-283.

________. "Les Branches de la phonétique," Mélanges René Fohalle, Gembloux, 1969, 83-94.

________. "Phonologie et phonétique," Marche Romane 18 (1968), 13-22.

________. "Remarques sur la scansion du vers français," FM 30 (1962), 119-131 and 193-211.

Mussafia, Adolfo. "Osservazioni sulla fonologia francese. La formola tj fra vocali," Romania 18 (1889), 529-550.

Nandris Octave. "Palatalisation et intensité: problèmes de linguistique romane et générale" (Communication à la Société, April 30th 1966), BSL 62 (1967), xviii-xix.

________. "La Palatalisation romane et le problème de ses origines," Mélanges de linguistique et de philologie romanes dédiés à la mémoire de Pierre Fouché, Paris, 1970, 1-15.

________. "Review of A. Martinet, Economie des changements phonétiques," FM 26 (1958), 62-67.

Navarro Tomás, Tomás. Studies In Spanish Phonology (tr. R. D. Abraham, [6th ed.]), Coral Gables, 1968.

________. Manual de pronunciación española (6th ed.). Madrid, 1950.

Nève de Mévergnies, François-Xavier. "Surprise en lisant Chomsky," forthcoming in Marche Romane, Special Issue on Linguistics, 1972-1973.

Newton, B.E. "Sibilant Loss in Northern Greek," The Canadian Journal of Linguistics 17 (1971), 1-15.

Nicholson, G.G. Recherches philologiques romanes. Paris, 1921.

Nilsson, Kim G. "The Development of Sibilants in Swedish," Phonetica 13 (1965), 177-183.

Nyrop, Cristopher. Grammaire historique de la langue française, I, Paris, 1902.

Oettinger, Anthony G. "Linguistics and Mathematics," in Studies Presented to Joshua Whatmough. The Hague, 1957, 179-186.

Oroz, Rodolfo. La lengua castellana en Chile. Santiago, 1966.

Orthographia Einsidlensis, in Keil, VIII, 297-299.

Palaemo. *Aspri ars*, in Keil, V, 525-554.

Pande, Govind C. "Vie et mort des langues" (tr. Havet, Jacques), *Diogène* 51 (1966), 197-214.

Papirius, Quintus. *De Orthographia*, in Keil, VII, 216.

Pariente, Jean-Claude, ed. *Essais sur le langage*. Paris, 1969.

Paris, Gaston. "L'Altération romane du *c* latin," *Annuaire de l'Ecole Pratique des Hautes études*, 1893.

________. "L'Appendix Probi," *Mélanges Renier*, Paris, 1887, 301-309.

________. "Le Mode et les étapes de l'altération du C en gallo-roman," *Romania* 33 (1904), 321-332.

________. "Note additionnelle [to A. Mussaffia's 'Osservazioni sulla fonologia francese']," *Romania* 18 (1889), 550-552.

________. *Les Plus anciens monuments de la langue française (IX^{e}, X^{e} siècles), publiés avec un commentaire philologique*. Paris, 1875.

________. "Review of E. Bourciez, *Précis de phonétique française*," *Romania* 18 (1889), 583-588.

________. "Review of G. Lücking, *Die ältesten französischen Mundarten*," *Romania* 7 (1878), 111-140.

________. "Review of A. Wallensköld, 'Un Cas de métathèse constante,'" *Romania* 26 (1897), 103.

Passy, Paul. *Etude sur les changements phonétiques et leurs caractères généraux*. Paris, 1891.

________. *Petite phonétique comparée des principales langues européennes* (2nd ed.). Leipsig, 1912.

Pedersen, Holger. "Zur Theorie der altgriechischen Palatalisierung," *TCLP* 8 (1939), 289-291.

Pei, Mario. *The Italian Language*. New York, 1941.

Perrot, Jean. *La Linguistique*. Paris, 1961.

________. "Review of R.A. Haadsma and J. Nuchelmans, *Précis de latin vulgaire*, "*BSL* 57 (1962), 95-97.

________. "Review of A. Martinet, *Eléments de linguistique générale*," *BSL* 57 (1962), 19-25.

Philipon, E. "De l'*A* accentué précédé d'une palatale," *Romania* 16 (1887), 263-277.

Philipp, Marthe. *Le Système phonologique du parler de Blaesheim, Etude synchronique et diachronique*. Nancy, 1965.

Phillips, Hosea. *Etude du parler de la paroisse Evangéline (Louisiane)*. Paris, 1936.

Phocas. *Ars de nomine et verbo*, in Keil, V, 405-441.

Pirson, Jules. "Das Casseler Glossar," *ZRPh* 26 (1902), 521-531.

________. *La Langue des inscriptions latines de la Gaule*. Brussels, 1901.

________. *La Phonétique des inscriptions latines de la Gaule*. Liege, 1900.

________. "Pamphlets bas-latins du VII^{e} siècle," *Mélanges Maurice Wilmotte*, Paris, 1910, 485-552.

________. "Merowingische und karolingische Formulare" (*Sammlung vulgärlateinischer Texte*, 5th *Heft*), Heidelberg, 1913.

________. "Review of H.-F. Muller, *A Chronology of Vulgar Latin*," *ZRPh* 55 (1935), 216-219.

Pisani, Vittore. "Palatalizzazioni osche e latine," *AGI* 39 (1954), 112-119.

Plotius, Marcus Claudius Marius Sacerdos. *Artes grammaticarum*, in Keil, VI, 414-546.

Poerck, Guy de. "La Diphtongaison des voyelles fermées du latin, principalement dans le domaine gallo-roman, et la palatalisation du u," *Romanica Gandensia* 1 (1953), 23-92.

________. "Jonas (Fragment de Valenciennes)," *Romanica Gandensia* 4 (1955), 31-66.

Polanyi, Michael. "Science and Reality," *The British Journal for the Philosophy of Science* 18 (1968), 177-196.

Pompeius. *Commentum Artis Donati*, in Keil, V, 81-328.

Pope, Mildred K. *From Latin to Modern French With Especial Consideration of Anglo-Norman* (5th ed.). Manchester, 1966.

Popper, Karl. *The Logic of Scientific Discovery*. New York, 1959.

Posner, Rebecca. "Directions ofr Historical Linguistics," *RPh* 23 (1969-1970), 143-153.

________. I. Iordan and J. Orr. *An Introduction to Romance Linguistics* (2nd ed. rev.). Oxford, 1970.

________. "Positivism in Historical Linguistics," *RPh* 20 (1966), 321-323.

________. *The Romance Languages: A Linguistic Introduction*, New York, 1966.

________. "Review Article: Modernists Versus Traditionalists, A Confrontation in Continental Europe," *RPh* 21 (1967-1968), 544-558.

________. "Review Article: Problems in Spanish Diachronic Phonology," *RPh* 16 (1962-1963), 428-437.

________. "Review of W.P. Lehmann and Y. Malkiel, eds., *Directions for Historical Linguistics*," *RPh* 23 (1969-1970).

Postal, Paul M. *Aspects of Phonological Theory*. New York, 1968.

________. "Review Article: A. Martinet, *Elements of General Linguistics*," *Foundations of Language* 2 (1966), 151-186.

Pottier, Bernard. "La Grammaire générative et la linguistique," *Travaux de Linguistique et Littérature de l'Univ. de Strasbourg* 6 (1968), 7-26.

________. "Review of E. Alarcos Llorach, *Fonología española*," *BSL* 50 (1954), 111-114.

________. "Review of A. Martinet, *A Functional View of Language* " *BSL* 57 (1962), 29-32.

________. "Review of S. Saporta and H. Contreras, *A Phonological Grammar of Spanish*," *BSL* 57 (1962), 128-129.

________. "Review of B.E. Vidos, *Manuale di linguistica romanza*," *Romania* 81 (1960), 122-124.

Priscianus Caesariensis Grammaticus. *Ad Iulianum: Institionum grammaticarum*, in Keil, II, 1-20.

Probus Valerius Berytius. *Catholica: Instituta artium: De nomine excerpta: De ultimis syllabis*, in Keil, I, 1-264.

Prou, Maurice. "Note sur le latin des monnaies mérovingiennes," *Mélanges Maurice Wilmotte*, Paris, 1910, 523-540.

Psichari, Jean. Communication à la Société, February 7th, 1887, *BSL* 6-8 (1885-1888), 132.

Pulgram, Ernst. "Consonant Cluster, Consonant Sequence, and the Syllable," *Phonetica* 13 (1965), 76-81.

________. "Linguistic Expansion and Diversification," Studies Presented to Joshua Whatmough, The Hague, 1957, 239-252.

________. "Où en est la phonétique? A propos de l'Album phonétique de Georges Straka," ZRPh 83 (1967), 315-357.

________. "Sciences, Humanities, and the Place of Linguistics," Linguistics 53 (1969), 70-92.

________. "Structural Comparison, Diasystems, and Dialectology," Linguistics 4 (1964), 66-82.

Purczinsky, Julius. "Additional Frankish Superstratum Influence in Old French," RPh 18 (1964), 27-31.

________. "Review of G. Rohlfs, Vom Vulgärlatein zum Altfranzösischen," RPh 22 (1968-1969), 115-116.

Quilis, Antonio. "Description phonétique du parler madrilène actuel," Phonetica 12 (1965), 19-24.

Rajna, Pio. "San Mommoleno e il linguaggio romanzo," Mélanges M. Wilmotte, Paris, 1910, 541-567.

Redolfi, A. "Die Lautverhältnisse des bergellischen Dialekts," ZRPh 8 (1184), 161-204.

Reid, T.B.W. "Historical Philology and Linguistic Science," Lecture, Oxford (1959), quoted by Kurt Baldinger, "Traditionelle Sprachwissenschaft," 534-535.

Remacle, Louis. Le Problème de l'ancien wallon, Liege. 1948.

________. Les Variations de l'H secondaire en Ardenne liégeoise: Le Problème de l'h en liégeois. Liege and Paris, 1944.

________. "Review of E. Gamillscheg, Germanische Siedlung in Belgien und Nordfrankreich," ZRPh 59 (1939), 313-324.

Ribezzo, Francisco. "La teoria ascoliana delle gutturali indo-europee," AGI 22 (1928), 131-151.

Richter, Elise. Beiträge zur Geschichte der Romanismen: Chronologische Phonetik des Französischen bis zum Ende des 8 Jahrhunderts, Halle, 1934.

________. "Review of A. Dauzat, Essai de méthodologie linguistique," ZRPh 31 (1907), 621-626.

Ringenson, Karin. Etude sur la palatalisation de k devant une voyelle antérieure en français, Paris, 1922.

________. "Etude sur la palatalisation de k dans les parlers provençaux," RLiR 6 (1930), 31-90.

Rohlfs, Gerhard. *From Vulgar Latin to Old French: An Introduction to the Study of the Old French Language* (tr. V. Almazan and L. McCarthy). Detroit, 1970.

________. *Romanische Philologie. I: Allgemeine Romanistik.* Heidelberg, 1950.

________. *Sermo vulgaris latinus. Vulgärlateinisches Lesebuch.* Halle, 1951.

________. *Vom Vulgärlatein zum Altfranzösischen.* Tubingen, 1960.

Romeo, Luigi. *The Economy of Diphthongization in Early Romance.* The Hague, 1968.

Rona, José Pedro. *El dialecto "fronterizo" del Norte del Uruguay.* Montevideo, 1965.

________. *La frontera lingüística entre el portugues y el español en el Norte del Uruguay.* Porto Alegre, 1963.

________. *Nuevos elementos acerca de la lengua charrúa.* Montevideo, 1964.

________. *"Vulgarización" o adaptación diastrática de neologismos o cultismos.* Montevideo, 1962.

Ronjat, Jules. "Review of E. Bourciez, *Eléments de linguistique romane*," *RLaR* 53 (1910), 437-450.

________. "Review of J. van Ginneken, *Principes de linguistique psicologique*," *RLaR* 53 (1910), 197-199.

________. "Review of W. Meyer-Lübke, *Einführung in das Studium der romanischen Sprachwissenschaft*," *RLaR* 62 (1923), 423-432.

________. "Review of G. Millardet, *Linguistique et dialectologie romanes*," *RLaR* 63 (1925), 152-158.

________. Review of G.G. Nicholson, *Recherches philologiques romanes*," *RLaR* 62 (1923), 441-442.

Roques, Mario. "Review of A. Dauzat, *Le Substrat germanique dans l'évolution phonétique du français*," *Romania* 63 (1937), 527.

________. "Review of F.-G. Mohl, *Introduction à la chronologie du latin vulgaire*," *Romania* 29 (1900), 266-287.

________. "Review of J. Pirson, *La Langue des inscriptions latines de la Gaule*," *Romania* 32 (1903), 307-311.

Rosén, Hannah. "Sibilants and Cognate Phones in One Form of Modern Greek," *Phonetica* 3 (1959), 217-237.

Rosetti, Alexandre. "De l'Interprétation des graphies doubles dans les textes écrits," BSL 29 (1929), 24-28.

________. "Remarques sur la dissimilation consonantique," Phonetica 12 (1965), 25-28.

________. "Sur la grammaire générative," Linguistics 66 (1971), 115-118.

Rossellini, Aldo. Trattato di fonetica storica dell'italiano. Milan, 1969.

Rousselot, Abbé Pierre-Jean. Les Modifications phonétiques du langage étudiées dans le patois d'une famille de Cellefrouin (Charente) (2 vols). Paris, 1891-1892.

________. Principes de phonétique expérimentale (2nd ed. rev.). Paris, 1924.

Saint-Jacques, Bernard. "Discussion: Review of a Review [P.M. Postal, "Review of A. Martinet, Elements of General Linguistics"], Foundations of Language 3 (1967), 294-298.

Salvioni, C. "Per la fonte della Sequenza volgare di Santa Eulalia," ZRPh 14 (1890), 371-375.

________. "Risoluzione palatine di k e g nelle Alpi lombarde," Studj di Filologia Romanza 8, 1-83; ref. incomplete in Wartburg, La Fragmentation, p. 51.

Sandmann, Manfred. "Diskussion aktueller Probleme. Phonologie und traditionelle Sprachwissenschaft. 1: Zu Martinet's Economie des changements phonétiques," ZRPh 74 (1958), 431-440.

________. "Review of E. Alarcos Llorach, Fonología española," ZRPh 70 (1954), 130-132.

Sapir, Edward. Language. An Introduction to the Study of Speech (2nd ed.). New York, 1949.

________. "La Réalité psychologique des phonèmes" (tr. Mlle Dalimier), Journal de sychologie 30 (1933), 247-245.

________. Selected Writings of Edward Sapir in Language, Culture and Personality, ed. David G. Mandelbaum, Berkeley and Los Angeles, 1963.

Saussure, Ferdinand de. Cours de linguistique générale. Geneva, 1916.

Sauvageot, Aurélien. "Evolution linguistique et changement phonétique," Linguistique contemporaine: Hommage à E. Buyssens, Brussels, 1970, 207-212.

Sayers, William. "Review of J.-D. Gendron, *Tendances phonétiques du français parlé au Canada*," *RPh* 22 (1968-1969), 632-633.

Scaurus, Terentius. *De Orthographia*, in Keil, VII, 1-35.

Šcerba, L. "Notes sur la transcription phonétique," *BSL* 29 (1929), 1-23.

Schane, Sanford A. "On the Non-Uniqueness of Phonological Representation," *Language* 44 (1968), 709-716.

________. "The Phoneme Revisited," *Language* 47 (1971), 503-521.

Schleicher, August. *La Théorie de Darwin et la science du langage*. (tr. M. de Pommayrol). Paris, 1868.

Schlesinger, J.M. "A Note On the Relationship Between Psychological and Linguistic Theories," *Foundations of Language* 3 (1967), 397-402.

Schmeck, Helmut. "Review of C. Battisti, *Avviamento allo studio del latino volgare*," *ZRPh* 70 (1954), 104-110.

Schuchardt, Hugo. "Phonétique française: *ch*," *Romania* 3 (1874), 282-285.

________. *Die romanischen Lehnwörter im Berberischen*. Vienna, 1918.

________. *Der Vokalismus des Vulgärlateins* (3 vols.). Leipsig, 1866-8.

Scriven, Michael. "Explanation and Prediction in Evolutionary Theory," *Science* [illegible] (1959), quoted by Ardon Lyon, "Causality."

Séguy, Jean. *Essai sur l'état des palatales et de -d- romans en occitan du XII^e^ siècle*, reprint of *Annales publiées par la Faculté de Lettres de Toulouse*, (February), 1953, 170-220.

Sepulcri, Antonio. "Contributo allo studio degli esiti di *cl* intervocalico nei dialetti italiani settentrionali," *AGI* 22-23 (1929), 445-464.

Sergius. *De Littera (in Donatum)*, in Keil, IV, 475-478.

Servius, Marius Honoratus. *Commentarius in Artem Donati*, in Keil, IV, 403-565.

Shevelov, Georges Y. *A Prehistory of Slavic*. New York, 1965.

Siemt, Oswald. *Ueber lateinisches c vor e und i im Pikardischen*, Halle, 1881.

Simon, Péla. "A propos de la désarticulation de la consonne palatale ŋ dans la prononciation du français d'aujourd'hui," *Phonétique et linguistique romanes: Mélanges G. Straka* 1, 1970, 67-98.

________. *Les Consonnes françaises, mouvements et positions articulatoires à la lumière de la radiocinématographie*, Paris, 1967.

Sindou, Raymond. "Review of L. Michel, *Etude du son 's'*," *FM* 24 (1956), 152-158.

Skok, Petar. "Zum Balkanlatein," *ZRPh* 48 (1928), 398-413; 50 (1930), 484-532; 54 (1934), 424-499.

________. "Beiträge zur Kunde des romanischen Elements in Serbokroatischen," *ZRPh* 41 (1921), 147-152.

________. "Zur Chronologie der Palatalisierung von *c g qu gu* vor *e i y i̯* im Balkanlatein," *ZRPh* 46 (1926), 385-410.

________. "Neue Beiträge zur Kunde des romanischen Elements in der serbo-kroatischen Sprache," *ZRPh* 38 (1917), 544-553.

________. "Studi toponomastici sull'isola di Veglia," *AGI* 24-25 (1930-1933), 117-137; 28 (1936), 54-63; 29 (1937), 113-137.

Sommerfelt, Alf. "L'Elément social dans les changements phonétiques et phonémiques," *Mélanges Marcel Cohen*, The Hague, 1970, 137-139.

________. "Structures linguistiques et structure des groupes sociaux," *Diogène* 51 (1966), 191-196.

________. "Sur le rôle des éléments moteurs dans les changements phonologiques, remarques sur la palatalisation des consonnes," *Journal de Psychologie* 30 (1933), 321-325.

________. "Le Système phonologique d'une langue australienne," *TCLP* 8 (1939), 209-212.

________. "Review of J. Bröndum-Nielsen, *Dialekter og dialektforskning*," *BSL* 28 (1928), 182-186.

Spang-Thomsen, Børge. "Review of G. Straka, *Album phonétique*," *Phonetica* 15 (1966), 60-62.

Spence, Nicol C.W. "The Palatalization of K,G + A in Gallo-Romance," *Archivum Linguisticum* 17 (1964), 21-37.

________. "Review of Y. Malkiel, 'The Interlocking of Narrow Sound Change,'" *RLiR* 31 (1967), 231-232.

Spitzer, Leo. *Hugo-Schuchardt Brevier*, Halle, 1922.

Stanley, Richard. "Redundancy Rules in Phonology," *Language* 43 (1967), 393-436.

Stemmer, Nathan. "A Note on Competence and Performance," *Linguistics* 65 (1971), 83-89.

Stockwell, Robert P., and Ronald K.S. Macaulay. *Linguistic Change and Generative Theory*. Bloomington, 1972.

Straka, Georges. *Album phonétique*. Quebec, 1965.

________. "Critique d'une critique. A propos de mon Album phonétique et d'un article d'Ernst Pulgram," *ZRPh* 83 (1967), 358-380.

________. "La Dislocation linguistique de la Romania et la formation des langues romanes à la lumière de la chronologie relative des changements phonétiques," *RLiR* 20 (1956), 249-267.

________. "La Division des sons du langage en voyelles et consonnes peut-elle être justifiée?" *Travaux de Linguistique et Littérature de l'Univ. de Strasbourg* 1 (1963), 17-100.

________. "L'Evolution phonétique du latin au français sous l'effet de l'énergie et de la faiblesse articulatoires," *Travaux de Linguistique et Littérature de l'Univ. de Strasbourg* 2 (1964), 17-98.

________. "Naissance et disparition des consonnes palatales dans l'évolution du latin au français," *Travaux de Linguistique et Littérature de l'Univ. de Strasbourg* 3 (1965), 117-167.

________. "Observations sur la chronologie et les dates de quelques modifications phonétiques en roman et en français prélittéraire," *RLaR* 71 (1953), 247-307.

________. "Phonétique et physiologie: l'évolution phonétique du français à la lumière des données relatives au fonctionnement des circuits neuro-musculaires des organes articulatoires," *Actes du 9e Congrès international de linguistique romane (Lisbon)*, I, 1961, 123-136.

________. "Remarques sur les voyelles nasales, leur origine et leur évolution en français," *RLiR* 19 (1955), 245-274.

________. "Review of V. Väänänen, *Le Latin vulgaire des inscriptions pompéiennes*," *RLiR* 24 (1960), 402-403.

Suchier, Hermann. *Forschungen zur romanischen Philologie*. Halle, 1900.

________. "Die Mundart des Leodegarsliedes," *ZRPh* 2 (1878), 253-302.

________. "Ueber das ältesten rätoromanische Sprachdenkmal," *ZRPh* 31 (1907), 707-711.

Swadesh, Morris. "A Condensed Account of Mandarin Phonetics," *TCLP* 8 (1939), 213-216.

Tae-Yong Pak. "Convertibility Between Distinctive Features and Phonemes," *Linguistics* 66 (1971), 97-114.

Tagliavini, Carlo. *Le origini delle lingue neolatine*. *Introduzione alla filologia romanza* (5th ed. rev.). Bologna, 1969.

Talmon, Alberto. "Saggio sul dialetto di Pragelato," *AGI* 18 (1914-1922), 1-104.

Tarnóczi, Laurent. "Essai de critique au structuralisme linguistique actuel," *Linguistics* 57 (1970), 60-9..

Taverney, A. "Phonétique roumaine. Le traitement de *tj* et du suffixe *ulum*, *ulam* en roumain," *Etudes romanes dédiées à Gaston Paris*, Paris, 1891.

Terracini, Benvenuto. "Il parlare d'Usseglio (Continuazione)," *AGI* 17 (1910-1913), 289-350.

________. "Review of A. Duraffour, *Phénomènes généraux*," *AGI* 26-27 (1924-1935), 130-144.

________. "Review of W. von Wartburg, *Die Ausgliederung*, *AGI* 28 (1936), 71-73.

Thomsen, V. *L'i parasite et les consonnes mouillées romanes*, *Mélanges de la Société de linguistique de Paris* 3, 1879.

Togeby, Knud. "Désorganisation et réorganisation dans l'histoire des langues romanes," *Estructuralismo e historia*. *Miscelánea homenaje a André Martinet*, I, 1957, 277-287.

________. "Les Explications phonologiques historiques sont-elles possibles?" *RPh* 13 (1959-1960), 401-413.

________. "Le Faible rendement des oppositions phonologiques et grammaticales en français," *BSL* 48 (1952), 33-39.

Trubetzkoy, Nicolai S. "Die Aufhebung der phonologischen Gegensätze," *TCLP* 6 (1936), 29-45.

________. "Essai d'une théorie des oppositions phonologiques," *Journal de Psychologie* 33 (1936), 5-18.

________. "La Phonologie actuelle," *Journal de Psychologie* 30 (1933), 227-245.

________. "Phonologie und Sprachgeographie," *TCLP* 4 (1931), 228-234.

________. "Die phonologischen Systeme," *TCLP* 4 (1931), 96-116.

________. "*Principes de phonologie* (tr. J. Cantineau), Paris, 1949.

Väänänen, Veikko. *Introduction au latin vulgaire*. Paris, 1963.

________. *Le Latin vulgaire des inscriptions pompéiennes*. Helsinki, 1937.

Vachek, Josef. "Phonemes and Phonological Units," *TCLP* 6 (1936), 235-239.

________. *A Prague School Reader in Linguistics*. Bloomington, 1964.

Vachek, Josef, and Josef Dubsky. *Dictionnaire de linguistique de l'Ecole de Prague*. Utrecht and Antwerp, 1960.

Varnhagen, Hermann. "Das altnormannische *C*," *ZRPh* 3 (1879), 161-177.

________. "Zum Fragment von Valenciennes," *ZRPh* 4 (1880), 97-99.

Vendryes, Joseph. "La Comparaison en linguistique," *BSL* 42 (1945), 1-18.

______. *Le Langage: Introduction Linguistique à l'histoire*. Paris, 1921.

________. "Antoine Meillet," *BSL* 38 (1937), 1-42.

________. "Sur les tâches de la linguistique statique," *Journal de Psychologie* 30 (1933), 173-184.

________. "Sur le traitement brittonique de *i* en hiatus," *BSL* 47 (1951), 1-10.

________. "Review of M. Cohen, *Le Langage*," BSL 47 (1951), 68-69.

________. "Review of W. von Wartburg. *Problèmes et méthodes de la linguistique*," BSL 44 (1947-1948), 8-13.

Ventura, F. *La teoria ascoliana sulle velari indo-europee primitive, e la scoperta del tocario*. Livorno, 1926.

Vernier, A. "Review of M. Bonnet, *Le Latin de Grégoire de Tours*," *Romania* 20 (1891), 470-473.

Vianna, Aniceto. *Portugais. Phonétique et phonologie. Morphologie.* Textes, Leipsig, 1903.

Victorinus, Marius. *Ars grammatica*, in Keil, VI, 1-184.

Victorinus Maximus. *De Arte grammatica*, in Keil, VI, 185-205.

Vidos, Benedek E. *Handboek tot de romaanse taalkunde*, 's Hertogenbosch, 1956.

Vihman, Marilyn M. "Review of R. Hadlich, *The Phonological History of Vegliote*," *RPh* 22 (1968-1969), 621-626.

Vising, J. "Ueber französisches *ie* für lateinisches *á*," *ZRPh* 6 (1882), 372-385.

Vurpas-Gaillard, A.-M. "Les Alternances des palatales en franco-provençal d'après le patois de Chambost-Allières (Rhône)," *RLiR* 30 (1966), 314-323.

Wagner, Max Leopold. "Amerikanisch-Spanish und Vulgarlatein," *ZRPh* 40 (1920), 286-312.

________. "Review of F. Beguinot, *Di alcune parole di linguaggi nord-africani derivate del latino*," *ZRPh* 63 (1943), 198-201.

Wagner, Robert Léon. "Review of A. Martinet, *Phonology as Functional Phonetics*," *BSL* 46 (1950), 47-48.

________. "Review of M.K. Pope, *From Latin to Modern French*," *BSL* 48 (1952), 53-54.

________. "Review of L. Remacle, *Le Problème de l'ancien wallon*," *BSL* 45 (1949), 114-117.

________. "Review of W. von Wartburg, 'Die Ausgliederung,'" *BSL* 47 (1951), 110-116.

Waitz, Hugo. "Die Mundart von Namur," *ZRPh* 24 (1900), 251-318.

Wallensköld, A. "Un Cas de métathèse constante pendant la période de formation de l'ancien français," *Mélanges Carl Walhund*, Mâcon, 1896, 145-162.

Wang, William S-Y. "The Chinese Language," *Scientific American* 228, 2, (February 1973), 50-60.

________. "The Measurement of Functional Load," *Phonetica* 16 (1967), 36-54.

Warnant, Léon. *La Constitution phonique du mot wallon: Etude fondée sur le patois d'Oreye (Hesbaye liégeoise)*. Paris, 1956.

Wartburg, Walther von. "Die Ausgliederung der romanischen Sprachräume," *ZRPh* 56 (1936), 1-48.

________. Bibliographie des dictionnaires patois gallo-romans (2nd ed. rev.). Paris and Geneva, 1969.

________. Evolution et structure de la langue française (5th ed. rev.). Bern, 1958.

________. La Fragmentation linguistique de la Romania (tr. Jacques Allières and Georges Straka), Paris, 1967.

________. Problèmes et méthodes de la linguistique (tr. Pierre Maillard; 2nd ed.). Paris, 1963.

________. "Review of A. Ewert, The Strasburg Oaths, and A. Tabachovitz, Quelques remarques complementaires sur la langue des Serments de Strasbourg," ZRPh 57 (1937), 655-656.

________. "Review of A.G. Haudricourt and A.G. Juilland, Essai pour une histoire structurale du phonétisme français," ZRPh 66 (1950), 376-378.

________. "Review of W. Meyer-Lübke, Einführung in das Studium der romanischen Sprachwissenschaft," ZRPh 42 (1922), 371-377.

________. "Review of R. Menéndez Pidal, Orígenes del español," ZRPh 48 (1928), 457-461.

Waterman, John T. Perspectives in Linguistics. Chicago, 1963.

Weinreich, Uriel. "Is a Structural Dialectology Possible?" Word 10 (1954), 388-400.

________. Languages in Contact, Findings and Problems. The Hague, 1953.

Weinreich, Uriel, William Labov and Marvin Herzog. "Empirical Foundations for a Theory of Language Change," in W.P. Lehmann and Y. Malkiel, Directions for Historical Linguistics, 95-195.

Weinrich, Harald. Phonologische Studien zur romanischen Sprachgeschichte (2nd ed.). Munster, 1969.

________. "Review of W.D. Elcock, The Romance Languages," ZRPh 78 (1962), 178-180.

Whatmough, Joshua. Language: A Modern Synthesis. London, 1956.

Whorf, Benjamin L. Language, Thought, and Reality (3rd ed.). New York, 1958.

Wijk, Nicolas van. "L'Etude diachronique des phénomènes phonologiques et extra-phonologiques," TCLP 8 (1939), 297-318.

________. Phonologie, een hoofdstuk uit de structurele taalwetenschap. The Hague, 1939.

Wilson, Robert D. "A Criticism of Distinctive Features," Journal of Linguistics 2 (1966), 195-206.

Wittmann, Henri. "Developments in Diachronic Linguistics (1)," Linguistics 65 (1971), 90-101.

________. "Discussion. Elements of General Linguistics: André Martinet or P.M. Postal?" Foundations of Language 7 (1971), 119-124.

Zauner, Adolf. "C' im Anlaut der Mittelsilbe der Proparoxytona im Französischen," ZRPh 41 (1921), 210-218.

________. "Zur Geschichte der Labialen und Palatalen im Französischen," ZRPh 40 (1920), 612-619.

Zéliqzon, L. "Die französische Mundart in der preussischen Wallonie und in Belgien längs der preussischen Grenze," ZRPh 17 (1893), 419-440.

Zgusta, Ladislav. "Review of B. Malmberg, Les Nouvelles tendances de la linguistique," Linguistics 70 (1971), 106.

Zimmermann, A. "Zum Uebergang von intervokalischen t zum d im Vulgärlatein," ZRPh 25 (1901), 731-732.

Zipf, George K. Human Behavior and the Principle of Least Effort, Cambridge, 1949.

________. The Psycho-Biology of Language: An Introduction to Dynamic Philology. Boston, 1935.

________. "Relative Frequency As a Determinant of Phonetic Change," Harvard Studies in Classical Philology 40 (1929), 1-95.